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POLLUTION OF THE INTERSTATE WATERS OF THE GRAND CALUMET RIVER, LITTLE CALUMET RIVER, CALUMET RIVER, WOLF LAKE, LAKE MICHIGAN AND THEIR TRIBUTARIES, ILLINOIS-INDIANA. PROCEEDINGS OF CONFERENCE, SESSION (2ND) HELD AT CHICAGO, ILLINOIS, ON DECEMBER 11-12, 1968.

VOLUME I

Federal Water Pollution Control Administration
Washington, D. C.

12 December 1968

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SECOND SESSION
OF THE
CONFERENCE

IN THE MATTER OF POLLUTION OF
THE INTERSTATE WATERS OF THE
Grand Calumet River, Little Calumet River,
Calumet River, Wolf Lake, Lake Michigan,
and their tributaries

held in
Chicago, Illinois
on
DECEMBER 11 and 12, 1968

TRANSCRIPT OF PROCEEDINGS

CONTENTS

PAGE:

Opening Statement
By Murray Stein 5

Executive Session 477

PROGRESS REPORTS:

Col. Jack Corey 9

Clarence W. Klassen (Municipalities) 16

Clarence W. Klassen (Industries) 57

Perry E. Miller (Municipalities) 27

Perry E. Miller (Industries) 88, 167, 232

John E. Egan 36

William J. Riley 38

Vinton W. Bacon 62, 461

J. R. Brough 141

Herbert J. Dunsmore 193

Carl Broman 235

E. E. Minney 275

James C. Vaughn 287

Robert J. Bowden 331

Second Session of the Conference in the Matter of Pollution of the Interstate Waters of the Grand Calumet River, Little Calumet River, Calumet River, Wolf Lake, Lake Michigan and their tributaries, held at the LaSalle Hotel, Chicago, Illinois, on December 11 and 12, 1968, at 9:30 a.m.

PRESIDING:

Mr. Murray Stein
Assistant Commissioner for Enforcement
Federal Water Pollution Control Administration
Department of the Interior

CONFEREES:

H. W. Poston
Regional Director
Federal Water Pollution Control Administration
Department of the Interior
Chicago, Illinois

John E. Egan
President, The Metropolitan Sanitary
District of Greater Chicago,
Chicago, Illinois

Blucher A. Poole
Technical Secretary, Indiana Stream
Pollution Control Board
Indianapolis, Indiana

Clarence W. Klassen
Technical Secretary
Illinois Sanitary Water Board
Springfield, Illinois

AIDES TO ABOVE:

Vinton W. Bacon
General Superintendent
The Metropolitan Sanitary District
of Greater Chicago
Chicago, Illinois

Perry E. Miller
Assistant Director
Division of Sanitary Engineering
Indiana State Board of Health
Indianapolis, Indiana

Dr. C. S. Boruff
Illinois Sanitary Water Board
Chicago, Illinois

PARTICIPANTS:

Colonel Jack Corey
Representative of Mayor Richard J. Daley
City of Chicago, Chicago, Illinois

Clarence W. Klassen
Conferee and Technical Secretary
Illinois Sanitary Water Board
Springfield, Illinois

Perry E. Miller
Assistant Director
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Metropolitan Sanitary District of
Greater Chicago, Chicago, Illinois

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Inland Steel Company
East Chicago, Indiana

Herbert J. Dunsmore
Assistant to Administrative Vice President, Engr.
United States Steel Corporation
Chicago, Illinois

Carl Broman
Superintendent, Fuel & Environmental
Control, Youngstown Sheet & Tube Company
Indiana Harbor Works, East Chicago, Indiana

PARTICIPANTS (CONTINUED):

E. Eugene Minney
Water Quality Task Force Officer
Izaak Walton League of America
Griffith, Indiana

James C. Vaughn
Engineer, Water Purification
Chicago, Illinois

Robert J. Bowden
Chief, Calumet Area Surveillance Unit
Lake Michigan Basin Office, Federal
Water Pollution Control Administration
Chicago, Illinois

THOSE IN ATTENDANCE:

Mr. V. K. Abel
Quartermaster Corps
U. S. Coast Guard
Chicago, Illinois

Mr. F. K. Armour
Vice-President of Engineering
Interlake Steel Corporation
Chicago, Illinois

Mr. Thomas Atchison
Chief, Mechanics Branch
U. S. Army Post Engineers
Fort Sheridan, Illinois

Mr. R. C. Atkins
Technical Superintendent
duPont
East Chicago, Indiana

Mrs. C. S. Barrett
League of Women Voters of Chicago
Chicago, Illinois

Dr. Jack Bregman
Deputy Asst. Secretary for Water
Pollution Control, U.S. Depart. of
the Interior, Washington, D. C.

THOSE IN ATTENDANCE (Continued):

Mr. W. B. Barton
duPont
Wilmington, Delaware

Mr. Paul Benson
Correspondent
McGraw-Hill World News
Chicago, Illinois

Mr. Louis F. Birkel
Superintendent Water Management
Republic Steel Corporation
Cleveland, Ohio

Mr. Carl T. Blomgren, Jr.
Sanitary Engineer
Illinois Sanitary Water Board
Chicago, Illinois

Mrs. Russell Boynge, Jr.
Chairman, League of Women Voters
Lake Michigan Inter-League Group
Wilmette, Illinois

Mr. Arthur F. Brown
Assistant Superintendent of Utilities
Midwest Steel - Div. National Steel Corporation
Portage, Indiana

Mr. Paul L. Brueckner
Supervisor-Technician
Allied Chemical Corporation
Chicago, Illinois

Mr. Marshall F. Bynum
Commissioner
Chicago Park District
Chicago, Illinois

Mr. Charles A. Caswell
Senior Engineer
Cyrus Wm. Rice Company
Chicago, Illinois

THOSE IN ATTENDANCE (Continued):

Ensign Martin P. Clark
Law Enforcement Officer
U. S. Coast Guard
Chicago, Illinois

Mr. Richard G. Dalbke
Engineer
Kaiser Engineers, Incorporated
Chicago, Illinois

Mr. George Danchi
Sanitary Engineer
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East Chicago, Indiana

Mr. William Degutis
Monitoring Technician
Lake Michigan Basin Office
Chicago, Illinois

Mrs. Fay Donovan
Reporter
Gary Post-Tribune
Gary, Indiana

Mrs. Richard Erhardt
Oak Park-River Forest League
of Women Voters
River Forest, Illinois

Commander James A. Erickson
Head, Management Department
Midwest Division
Commandant Ninth Naval District
Great Lakes, Illinois
Mr. E. G. Fochtman
Manager
11 T Research Institute
Chicago, Illinois

THOSE IN ATTENDANCE (Continued):

Mr. S. A. Foust
Pollution Coordinator
Union Carbide
Whiting, Indiana

Mr. James A. Fowler
Engineer
East Chicago, Indiana

Mr. Vernon F. Frank
General Superintendent
Design Engineer
U. S. Steel Corporation
Lansing, Illinois

Miss Sherry Fyte
Reporter
Time of Hammond
Hammond, Indiana

Mr. C. W. Gansz
Special Representative
American Petroleum Institute
Chicago, Illinois

Mr. Robert V. Glass
Reporter
Chicago's American
Chicago, Illinois

Mr. George Gockstetter
Superintendent, Water Management
Republic Steel Corporation
Chicago, Illinois

Mr. W. M. Graham
Chief Engineer
American Maize Products Company
Roby, Indiana

Mrs. James Green
Member Oak Park Water Comm.
League of Women Voters
Oak Park, Illinois

THOSE IN ATTENDANCE (Continued):

Mr. H. J. Griffin (Retired)
Foreman, Great Lakes Sewage Plan
Waukegan, Illinois

Mr. James F. Grutsch
Coordinator of Waste Disposal
Chicago, Illinois

Mr. Michael A. Hanson
Conservation Control Engineer
U. S. Steel-Gary Sheet & Tin
Gary, Indiana

Mr. J. A. Hart
Special Projects Coordinator
Mobil Oil Corporation (Refinery)
East Chicago, Indiana

Mr. Edward Hausknecht
Project Engineer
Wisconsin Steel Works
Chicago, Illinois

Mr. George F. Jackson
Water Quality Control Specialist
Tulsa, Oklahoma

Mr. James W. Jardine
Commissioner, Water & Sewers
City of Chicago
Chicago, Illinois

Mrs. Joan L. Johnson
Chairman, Conservation Commission
Sierra Club
Lake Forest, Illinois

Mrs. Eileen Johnston
Wilmette League of Women Voters
Commission on Lake Michigan Pollution
Wilmette, Illinois

THOSE IN ATTENDANCE (Continued):

Mr. Fred G. Krikall
Environmental Control Engineer
Interlake Steel
Chicago, Illinois

Mrs. Albert Langeluttig
League of Women Voters
Lake Michigan Inter-League Group
Chesterton, Indiana

Mr. Allen S. Lavin
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Metropolitan Sanitary District
of Greater Chicago
Chicago, Illinois

Mr. Harley F. Lawhead
Assistant Chief, Engineering Division
North Central Division Office
Corps of Engineers
Chicago, Illinois

Mr. Jerry Lipson
Chicago Daily News
Chicago, Illinois

Mrs. Michael Anne McCann
Water Resource Chairman
League of Women Voters
Michigan City, Indiana

Mr. R. C. Mallatt
Coordinator of Air & Water Conservation
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Correspondent
McGraw-Hill Magazine
Chicago, Illinois

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Sun-Times
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Environmental Development, Incorporated
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General Manager
Richardson Company
Melrose Park, Illinois

Dr. John B. Nicosia
Mayor of East Chicago
East Chicago, Indiana

Mrs. Don Organ
Chairman, Oak Park-River Forest
Water Commission, League of
Women Voters
River Forest, Illinois

Mr. James M. Pappas
Sanitary Engineer
Federal Water Pollution Control
Administration, Great Lakes Region
Chicago, Illinois

Mr. Steven Parkieck
Sanitary Engineer
Federal Water Pollution Control
Administration, Great Lakes Region
Chicago, Illinois

Mr. Richard A. Pavia
Assistant Commissioner, Chicago
Department of Water & Sewers
Chicago, Illinois

THOSE IN ATTENDANCE (Continued):

Mr. Harry M. Pawlowski
Administrative Engineer
City of Chicago
Chicago, Illinois

Mr. Carlysle Pemberton, Jr.
Technical Programs Director
Federal Water Pollution Control
Administration, Great Lakes Region
Chicago, Illinois

Mr. R. E. Potts
LCDR, U. S. Coast Guard
Chicago, Illinois

Mrs. Samuel Rome
Water Resources Chairman
League of Women Voters of Illinois
Chicago, Illinois

Mr. Philip Rothenberg
Senior Assistant Attorney
Metropolitan Sanitary District
of Greater Chicago
Chicago, Illinois

Mr. Roy Ryling
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Chicago, Illinois

Mr. Charles Sandor
Water Control Engineer
Stream Pollution Control Board
Indiana State Board of Health
Indianapolis, Indiana

Mr. Leroy E. Scarce
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U. S. Department of the Interior
Federal Water Pollution Control
Administration, Lake Michigan Basin Office
Chicago, Illinois

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Mr. Robert E. Scheible
Chief Sanitary Engineer
Headquarters, 5th U.S. Army
Fort Sheridan, Illinois

Mr. C. W. Shipley
Izaak Walton League of America
Griffith, Indiana

Mr. Donald R. Shiras
Manager, Public Information
Inland Steel Company
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Mrs. John E. Shreve
President, Michigan City
League of Women Voters
Michigan City, Indiana

Mr. A. G. Slingo
Code 11 A
Midwest Division, Naval Facilities
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Mr. Wayne C. Stapf
Izaak Walton League of America
Plainfield, Indiana

Mr. Jerome E. Stein
Head, Department of Research
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Chicago, Illinois

Fred O. Sullivan
Sanitary Engineer
U. S. Army Corps of Engineers
Chicago District
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Chicago, Illinois

THOSE IN ATTENDANCE (Continued):

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Mr. Joseph L. Tite
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Indiana State Board of Health
LaPorte, Indiana

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Chicago, Illinois

Mr. Stan Twardy
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Air and Water Conservation
Standard Oil Company
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Mr. Thomas Voges
Assistant Superintendent
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Inland Steel Company
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Mr. Deyarman Wallace
Research Supervisor
Air & Water Pollution Control
Youngstown Sheet & Tube
Youngstown, Ohio

Mr. Robert O. Waller
Chief Water Engineer
Bureau of Water
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Miss Ann W. Wheat
League of Women Voters
Oak Park-River Forest
Oak Park, Illinois

THOSE IN ATTENDANCE (Continued):

Mr. Charles L. Woody
Assistant to Manufacturing Superintendent
Lever Brothers Company
Hammond, Indiana

- - -

PROCEEDINGS

OPENING STATEMENT

BY

MR. MURRAY STEIN

MR. STEIN: The Conference is open.

The Second Session of the Conference in the matter of Pollution of the Interstate Waters of the Grand Calumet River, Little Calumet River, Calumet River, Wolf Lake, Lake Michigan, and their Tributaries is being held under the provisions of the Federal Water Pollution Control Act as amended.

The First Session of the Conference was held in March 1965 on the basis of reports, surveys and studies. At the First Session the Conferees agreed to initiate an immediate remedial action program to protect water quality in these areas for the maximum number of legitimate uses. The representatives of the Federal and State Conferees and the Metropolitan Sanitary District of Greater Chicago agreed to institute immediate action in their respective jurisdictions that all sewage receive at least secondary treatment plus adequate effluent disinfection by April 14, 1966, a year from the distribution of the Conference summary. The Conferees also established a technical committee to evaluate water quality criteria and related areas in the Conference area, and a good deal of this work has been done.

The industries had the following schedule:

Preliminary engineering plan documents December 1966.

Final engineering plan documents June 1967.

And construction completed and facilities in operation by December 1968.

We had two progress meetings in the interim, one on March 15, 1967, another September 11, 1967, at which the Conferees evaluated the achievements of municipalities and industries in their efforts to install remedial facilities. The Conferees both times took note of the complexities of the situation and expressed general satisfaction with certain accomplishments when obviously there were other areas that had to be looked at. The Secretary of the Interior reaffirmed the terminal construction date for industries following the September 11, 1967, meeting, and this date remains

December 1968.

The Conferees are as follows:

The Indiana Stream Control Board will be represented by Mr. Blucher Poole; Illinois State Sanitary Water Board by Mr. Clarence Klassen; the Conferee for the Metropolitan Sanitary District of Greater Chicago is present in John Egan; Mr. H. W. Poston, Regional Director for the Federal Water Pollution Control Agency, has been designated as Conferee for the Federal Government. My name is Murray Stein, and I am from headquarters in Washington and the representative of Secretary Udall.

At this point I would like to indicate that we also have with us the Deputy Assistant Secretary for Water Pollution Control, Dr. Jack Bregman. Dr. Bregman.

I think we have explored this problem rather thoroughly, and the technique we are going to use here in trying to get a really true picture of what happened is just go through a roll call of the municipalities and the industries involved one by one. In other words, we have a little list and I don't think anyone is going to be missed. We are going to ask the State concerned or the sanitary district or in case of

Federal installations the Federal representatives for a status report.

In addition to that, any municipality or industrial representative who wishes to speak in its behalf should get in touch with his appropriate State representative or President Egan from the District and he can call on them.

Comments or questions will be available for the Conferees. I suggest other people hold those until they make their statement so we can proceed in an expeditious manner. We will be able to move forward, I think, in this conference if we do that. Our agendas, as you know, at these conferences are flexible, and if any of you have any other notions or feel you want to make a statement, we will take this up.

In addition to that, we expect to have a report from our technical committee after we have the status report case by case, and in addition to that I think the City of Chicago and its excellent Public Works and Water Department, which is doing a lot of work in the lake, will be available this afternoon to make a statement.

I think we have two problems that the

Conferees have to consider. One, how well are we meeting the schedule and are we doing the job?

Secondly, if we are meeting the schedule and a substantial portion of the work is being done, are we really improving water quality? Because if we have a remedial program and indications are that the water quality is deteriorating, we may have to take another look at that.

Obviously, our objective here is clean water, not just big monuments to pollution control and big plants. That is a means to the end and a method of getting the job done.

But to start this off, though, I would like to call on Col. Jack Corey, the representative of Mayor Daley.

Col. Corey.

STATEMENT OF COLONEL JACK COREY
REPRESENTATIVE OF MAYOR RICHARD J. DALEY
OF THE CITY OF CHICAGO

COL. COREY: Chairman Stein, distinguished Conferees, ladies and gentlemen.

Col. Jack Corey

Mayor Daley fully intended to be present with you this morning as he has in all previous meetings which have been held under the direction of Chairman Stein. Unfortunately, he is like many other citizens of Chicago who have succumbed to a bug and he was just simply unable to be present this morning. However, he had prepared remarks for this meeting and asked me to represent him and present his greetings to all of you to the City of Chicago and best wishes for a successful meeting.

I will read his remarks.

As you know, the Conference first convened in March 1965 when the former Secretary of Health, Education,and Welfare, Anthony J. Celebrezze, responded to a request of Illinois Governor Otto J. Kerner that efforts be made to prevent further pollution of Lake Michigan. Nearly four years have elapsed since that time and substantial progress has been made toward realization of the Conference objective, namely that Lake Michigan be preserved to provide a full range of public use. There is a growing public awareness that the availability of abundant supplies of nonpolluted fresh water may well be the most important natural resource of all in sustaining a healthy and growing economy.

Since March 1965 water quality criteria has been developed for all of Lake Michigan and with approval became Federal water standards. This in itself was a major milestone. Adoption of the aforementioned water quality criteria by the Federal Government has enabled the municipalities and industries along the southern region of Lake Michigan to plan for the design and construction of the facilities necessary for water pollution control and abatement. In reviewing progress to date, we may take just pride in knowing that public reaction in support of saving Lake Michigan has been mobilized and for this we commend the Conferees, the news media and others who have done an outstanding job in covering this subject.

On January 31, 1968, a Four-State conference involving the States of Illinois, Indiana, Michigan and Wisconsin was convened by the Federal Water Pollution Control Administration and this, too, can be cited as progress.

One of the contributions which the City of Chicago has made to the success of the two-state conference has been the expert testimony and the long-term data on Lake Michigan water and treatment problems furnished by the Chicago Water Department. Much of this data relates to the quantity of chemicals required to process a raw Lake Michigan water of variable quality into a uniformly safe, pure and wholesome finished product.

Since 1947 when the South Water Filtration Plant was placed in operation, the use of treatment chemicals at this facility has increased markedly. This is a very significant measure of the deterioration of the waters of Lake Michigan.

Specifically, the quantity of chlorine used to achieve water safety has risen from fifteen pounds per million gallons in 1947 to twenty-two pounds per million gallons in 1968, a forty-six percent increase.

The activated carbon dosage used to remove objectionable odors and tastes has increased from twenty-four to thirty-four pounds per million gallons of water treated.

And the coagulants used to remove suspended matter rose from one hundred three to one hundred six pounds per million gallons.

Col. Jack Corey

These represent increases of forty-two and -three percent respectively. This is a clear and indisputable indication of the continued deterioration of Lake Michigan's southern waters. This trend must be arrested now before the situation worsens. The cost will never be cheaper.

In closing, allow me to say that the objective established in 1965 by the Conferees, namely that Lake Michigan be preserved at a level of quality capable of sustaining all public uses, is a goal that must be attained. As we all know, setting goals is usually the easiest part of any job. The attainment of such objectives through the judicious use of a workable program and a realistic time schedule is a most important and difficult phase. However, there is ample evidence that such objectives can be met providing the participants exercise sufficient effort and desire.

The Conferees on February 1, 1966, agreed upon the following schedule for the abatement of pollution in the southern region of Lake Michigan:

No. 1. Completion of preliminary engineering plan documents by December 1966.

No. 2. Completion of final engineering

plan documents by June 1967.

No. 3. Complete construction and place water treatment facilities in operation by December 1968.

Today's meeting was called to enable the Conferees and the general public to learn of the progress being made. Nearly four years have elapsed since the Conference program was first established. Now it is possible to determine if our efforts have been sufficient to meet the goals agreed upon and to protect the great natural resource which is such a vital part of our economy and our lives. We anxiously await your findings, decisions and recommendations.

The Chicago Department of Water and Sewers is participating in this Conference and will furnish additional technical information during this meeting.

Thank you for being here this morning.

MR. STEIN: Thank you, Col. Corey. And accept our thanks for that message from Mayor Daley. I don't think there has been any mayor in the country that has cooperated with us more than Mayor Daley in cleaning up water pollution and calling the shots as they are without fear or favor. We have had a tremendous boost from his efforts and his cooperation through the years.

Thank you very much, sir.

COL. COREY: Thank you.

MR. STEIN: I would like to read a telegram now addressed to me.

> "I regret that a previous commitment prevents my being present to personally testify. Your meeting is vital to the future of Illinois. The facts are that unwarranted delay by several of the steel companies in complying with standards is causing the request for more time to meet the standards. No unreasonable demands should be made but everyone who pollutes the water of our State must know that this must be stopped as rapidly as possible and that if reasonable prompt action is not taken that the people of Illinois will not be the only ones to suffer the penalty."

Signed State Senator Paul Simon, Lieutenant Governor-Elect.

We have one short statement from Indiana, just to show our impartiality before we go into the hour of charm and the rollcall of the sources of pollution.

E. Eugene Minney of the Indiana Izaak Walton League has about a five-minute statement.

Mr. Minney.

MR. MINNEY: Mr. Stein, may I please wait until a little later? I am waiting for some information that I would like to pass on.

MR. STEIN: We will work you in when we can with the program.

MR. MINNEY: Thank you very much.

MR. STEIN: All right, thank you.

Do any of the Conferees wish to make a statement before we begin?

If not, let us start with the municipalities.

PROGRESS REPORT ON MUNICIPALITIES IN ILLINOIS

CLARENCE W. KLASSEN, CONFEREE AND TECHNICAL SECRETARY,
ILLINOIS SANITARY WATER BOARD, SPRINGFIELD, ILLINOIS

MR. STEIN: Illinois, Bloom Township Sanitary District.

MR. KLASSEN: Bloom County Sanitary District has a complete treatment plant with chlorination.

However, they have under construction and 75 percent completed a major plant expansion with additional and permanent chlorination facilities and will provide additional treatment over and beyond the secondary treatment and chlorination that is required. This will be completed approximately June or July of 1969.

MR. STEIN: Mr. Klassen, do they have secondary treatment now?

MR. KLASSEN: They have secondary treatment now. As a matter of fact, every municipality in Illinois Sanitary Water Board jurisdiction conforms to the requirements and has complete treatment and chlorination. I say this, even though none of these wastes get into Lake Michigan, we have assumed that they must meet all of the Lake Michigan requirements.

MR. STEIN: Do we assume that the chlorination is on a year-round basis?

MR. KLASSEN: Well, not at the present time for those that have temporary chlorination facilities. The permanent ones will. It is a question as we get on here, and I am sure--

MR. STEIN: Yes.

MR. KLASSEN: --a problem with other areas, a question of getting equipment.

MR. STEIN: I recognize that. What was the date again that you said the expansion is going to be completed?

MR. KLASSEN: The expansion will be completed--it is now 75 percent completed, it will be in operation July 1, 1969.

MR. STEIN: All right.

Mr. Poston.

MR. POSTON: Will this treatment provide above secondary treatment? Is that the object of this new treatment or is it an expansion to take care of additional loads?

MR. KLASSEN: It will provide over and above secondary treatment in addition to taking all of the sanitary and the industrial wastes within their jurisdiction.

MR. POSTON: Will there be phosphate removal in this?

MR. KLASSEN: Partially. Not as such.

MR. STEIN: The next one is Chicago M.S.D., Calumet Plant. President Egan.

MR. EGAN: We will have to wait for Mr.

Bacon on that to make a report.

MR. STEIN: Mr. Bacon hasn't arrived yet?

MR. EGAN: That is right.

MR. STEIN: Well, we will hold the record open for that and we will come back to that one.

Crete. Mr. Klassen.

MR. KLASSEN: Crete has complete treatment, permanent chlorination, and in addition to this a lagoon to take care of stormwater overflow and provide tertiary treatment. This is all in operation.

MR. STEIN: In other words, Crete is in full compliance?

MR. KLASSEN: Yes.

MR. STEIN: East Chicago.

MR. KLASSEN: I think that is in Indiana.

MR. STEIN: I guess our list is wrong.

MR. POSTON: You have got it in both places.

MR. STEIN: Both places? We will skip it. This is a typographical error. I really do know that that is in Indiana. (Laughter.) I don't know who prepared the list, though.

Flossmoor.

MR. KLASSEN: Flossmoor has a complete treatment plant, permanent chlorination and a lagoon. I might say at this point we have a hearing scheduled on operation at Flossmoor. The Flossmoor plant would have been included in the territory of the Chicago Sanitary District through annexation. The bill was verified today by the Governor and Flossmoor is still in the Sanitary Water Board jurisdiction but it is in compliance.

MR. POSTON: What about this lagoon, is that for stormwater overflow treatment?

MR. KLASSEN: The present lagoon is to take the overload on the plant. It should not be considered as a facility that is providing more than complete treatment for stormwater overflow. It does partially do some of that.

MR. STEIN: Hazel Crest.

MR. KLASSEN: That is in the Chicago Sanitary District. Sometimes it is difficult to say whether they are in or out. They are annexing territory all the time.

MR. STEIN: We will come back to that in a moment.

Homewood.

MR. KLASSEN: Homewood has a complete treatment plant. Currently the chlorination is a temporary facility, but they are chlorinating. They have a proposed expansion of the plant, including permanent chlorination and lagoons for stormwater overflow, and this is scheduled to start in construction in 1969.

MR. STEIN: When do you expect it might be completed, Mr. Klassen?

MR. KLASSEN: The end of 1969,along in there some place. But they are in compliance at the present time.

MR. STEIN: They are in compliance? This is just expansion?

MR. KLASSEN: This is additional treatment that we are requiring.

MR. STEIN: Yes.

Lansing.

MR. KLASSEN: Lansing has a complete treatment plant and temporary chlorination. They have a site purchased for a plant expansion and improvements and for permanent chlorination, but they are in compliance at the present time.

MR. STEIN: Matteson.

MR. KLASSEN: Matteson is now in the Chicago Sanitary District.

MR. STEIN: When they go into the District, maybe we should ask them, are they hooked up and go to the main system or do they have their own plant?

MR. KLASSEN: They have their own plant.

MR. STEIN: Olympia Fields?

MR. KLASSEN: Olympia Fields has three plants, the Graymoor, the Woods, the Kedzie Plant. The Graymoor Plant has secondary treatment, complete treatment, with temporary chlorination. This current plant is going to be abandoned March 1969. At present the new plant is 75 percent completed. But they are in compliance at the present time.

I might say that Olympia Fields is one of the many areas in Illinois that is rapidly growing, and while currently they are in compliance, we have a system in Illinois on data processing that the first of every month we get a printout on the plants that are up to 80 and to 90 percent overload so we can advise them that there will be no more short extensions and to start on additional facilities. But they are in compliance so far as this Conference is concerned.

The Woods Plant has complete treatment and temporary chlorination. They have a lagoon for additional treatment and stormwater. Permanent chlorination is now under construction which will replace the temporary chlorination. This will be completed March 1969.

The Kedzie Plant at Olympia Fields has complete treatment and temporary chlorination, and they have under study now supplemental treatment, which will be lagoon and permanent chlorination. But they are in compliance.

MR. STEIN: Steger.

MR. KLASSEN: Steger is completely in compliance. They have a complete treatment plant, activated sludge, a lagoon for stormwater overflow and additional treatment of two days' capacity, and they have permanent chlorination. They are in compliance.

MR. STEIN: Thornton.

MR. KLASSEN: Thornton has a complete treatment plant, temporary chlorination. Construction is to start on permanent chlorination and a lagoon with two-day capacity to give additional treatment for stormwater overflow. They are now in compliance.

MR. STEIN: Thank you very much, Mr. Klassen.

As I look at the record, all the Illinois communities under your jurisdiction are in compliance. Now, I think if you look at any compliance schedule, you will discover these situations that Mr. Klassen points out, because we are not dealing with static communities. They are always growing; they are expanding, and given the equipment shortage we had when we started this we know that many of them had to go to temporary chlorination expedients and all you could do was put in an order for permanent chlorination devices, and these evidently are being attended to and inevitably in some of these cases there have to be operations checks.

But I would say, unless any of the Conferees had to say anything, that as far as I can see, particularly in dealing with a load of communities that is represented by Illinois, and I am just speaking for the list we went on, that this meets the compliance requirements. I want to make this clear, this is not just substantial compliance. Illinois is in compliance.

Yes?

MR. POSTON: You do still have problems in some of these plants in Illinois, and I noticed he mentioned operation is one problem that needed attention and he was taking care of this. We have expansion in two or three of these plants--well, there was 75 percent plant expansion, for instance, in Bloom Township, which indicates that rapidly these plants are needing these extra treatment facilities if they are going to maintain an effluent that meets the standards of requirements that have been set up by the technical committee and by the State of Illinois, rather.

MR. KLASSEN: That is correct. Operation problems are always going to be with us, and we have a technique in Illinois that I think is more effective than any laws or orders. When a plant is approaching the design capacity we shut off all permits for sewer extensions. It was required in Illinois like in many of the other States that a municipality must receive a permit from the Sanitary Water Board before they can extend the sewer system, and this is under our authority to prevent pollution. By refusing these permits this brings to a halt local expansion and suddenly the city finds that the subdividers, the equipment people, the building material people, the finance people are all on our side and on the city officials to get the plant upgraded, and this has been a real good technique that we followed.

But you are right, Mr. Poston, in operational problems and expansion, whether it is in Illinois or in Indiana, they are faced with the same thing, these are always going to be with us.

MR. POSTON: Quite frankly, I think that it will be brought out a little later that the quality of the water in our streams in this Calumet Area are not what we had anticipated, and I am looking for reasons for this, reasons that the quality hasn't shown some marked improvement with construction measures, abatement measures that have been taking place prior to and since 1965, prior to this date and since 1965.

MR. KLASSEN: You will find those reasons on page 4 of our presentation and the estimated improvement when the new plant in the Bloom Township Sanitary District goes into operation. In addition, some of the material that we are receiving in Illinois is from Indiana. (Progress Report for the Illinois Sanitary **Water** Board follows.)

PROGRESS REPORT
TO CONFEREES

ILLINOIS-INDIANA INTERSTATE POLLUTION
LAKE MICHIGAN - CALUMET AREA

FOR AREA UNDER JURISDICTION

ILLINOIS SANITARY WATER BOARD

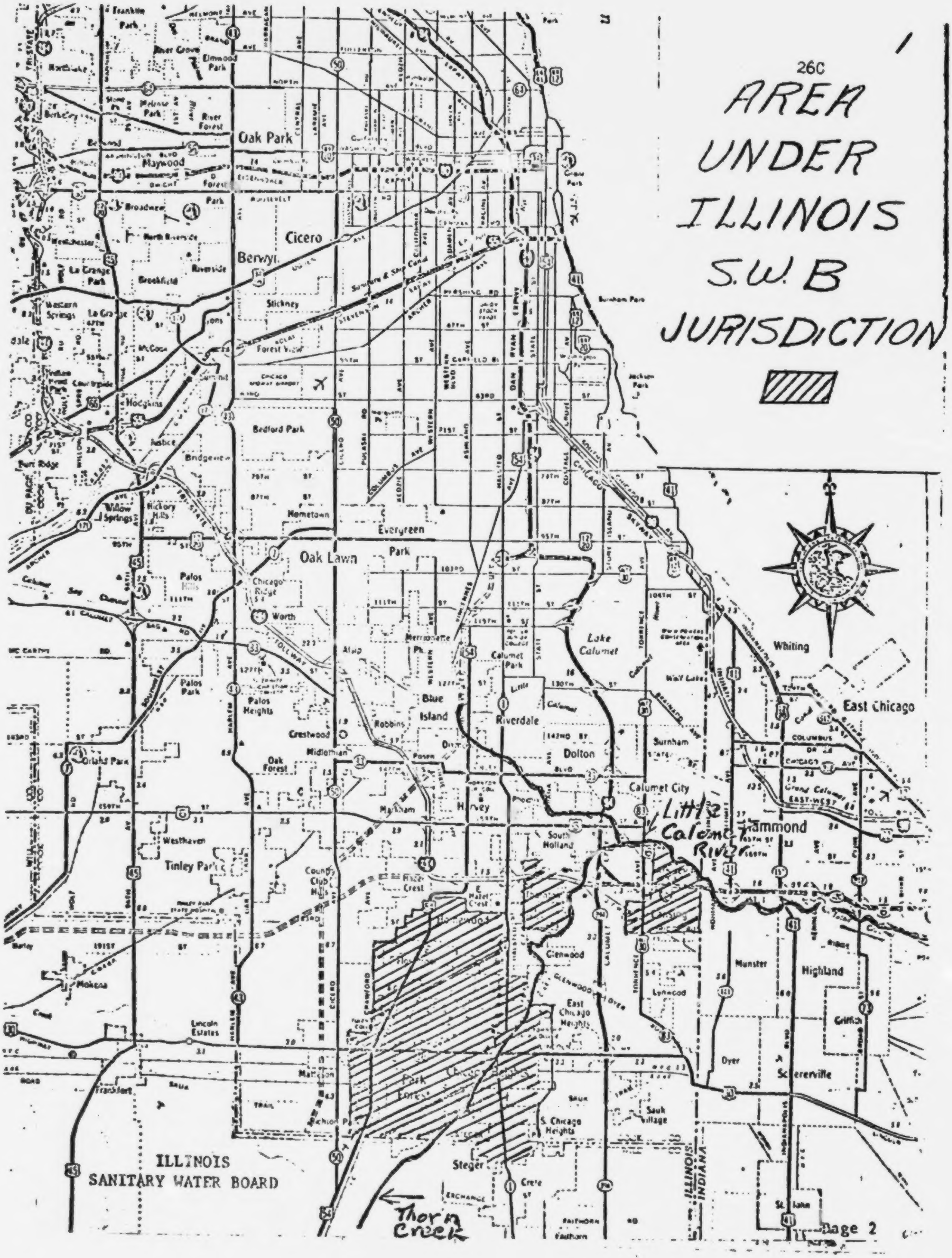
DECEMBER 11, 1968

TABLE OF CONTENTS

PAGE

1. Area Map indicating Territory under Sanitary Water Board jurisdiction . . . 1
2. Small Scale Map indicating Thorn Creek & Little Calumet River 2
3. Introduction and Summary . . . . 3 - 4
4. Table of Municipalities and Status . . . . 5 - 6
5. Summary Statement for each Community . . . . 7 - 9
6. Water Quality Data
    A. Station HB 02 - Little Calumet River at State Line . . . . 10 - 13
    B. Station HBD 01 - Thorn Creek at 167th Street . . . . 14 - 17
    C. Station HB 04 - Little Calumet River at 159th Street . . . . 18 - 21

1



ILLINOIS
SANITARY WATER BOARD

AREA
UNDER
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JURISDICTION

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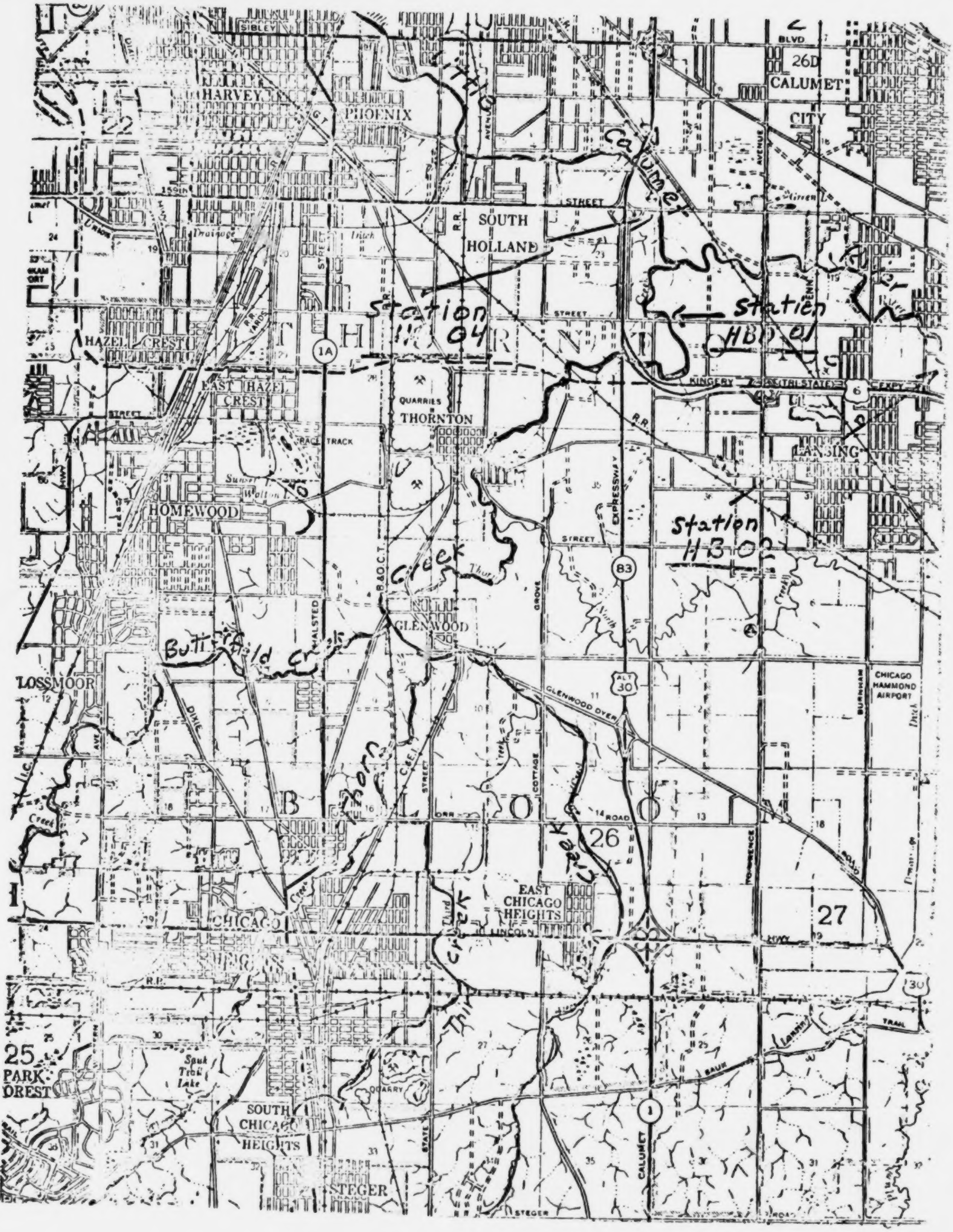
HARVEY
PHOENIX
CALUMET CITY
26D
SOUTH HOLLAND
Little Calumet River
Station HB 04
Station HB 01
HAZEL CREST
EAST HAZEL CREST
QUARRIES
THORNTON
RACE TRACK
LANSING
KINGERY
TRI-STATE
EXPY.
Station HB 02
HOMEWOOD
Thorn Creek
GLENWOOD
Butterfield Creek
FLOSSMOOR
CHICAGO HAMMOND AIRPORT
GLENWOOD DYER
EXPRESSWAY
26
Deer Creek
27
EAST CHICAGO HEIGHTS
CHICAGO HEIGHTS
Third Creek
LINCOLN
25
PARK FOREST
Sauk Trail Lake
QUARRY
SOUTH CHICAGO HEIGHTS
STEGER
CALUMET
SIBLEY
STREET
HALSTED
STATE
GROVE
COTTAGE
BURNHAM
TRAIL

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STATE OF ILLINOIS
SANITARY WATER BOARD
SPRINGFIELD

TECHNICAL SECRETARY
CLARENCE W. KLASSEN
CHIEF SANITARY ENGINEER
DEPARTMENT OF PUBLIC HEALTH

ADDRESS LETTERS TO:
STATE SANITARY WATER BOARD
SPRINGFIELD, ILLINOIS
62706

26E

ILLINOIS - INDIANA INTERSTATE POLLUTION
LAKE MICHIGAN - CALUMET AREA

PROGRESS REPORT TO CONFEREES
December 11, 1968

The Conference called by the Federal Water Pollution Control Administration, March 2 - 9, 1965, resulted in agreement to obtain secondary treatment of all sewage and adequate effluent disinfection. All communities within the area under Sanitary Water Board jurisdiction, and within the enforcement area, have secondary biological treatment and adequate effluent disinfection, and are therefore, in compliance with the recommendations adopted by the Conferees. These communities are: Homewood, Lansing, Flossmoor, Crete, Steger, Thornton, Olympia Fields, Richton Park and the Sanitary District of Bloom Township (serving: Chicago Heights, Park Forest, South Chicago Heights.)

The industries in the subject area are generally in or adjacent to Chicago Heights and are tributary to the Sanitary District of Bloom Township Sewage Treatment Works. These industries are generally the "metal" or "chemical" industries which discharge cooling water to storm sewers owned and operated by the City of Chicago Heights, which discharge to Third Creek tributary to Thorn Creek. Most industries have pre-treatment facilities which, when properly operated and maintained, would provide an effluent of satisfactory quality for discharge to waters of the State. Most of these industries are modifying their internal plant piping to permit water re-use and to thus eliminate discharge to the Creek. The remaining industries are improving their pre-treatment facilities and making necessary piping changes to discharge to the Sanitary District of Bloom Township facilities. This work has been slowed by delays in delivery of necessary equipment. The Sanitary District is also endeavoring to coordinate acceptance of additional industrial waste flows with the current plant expansion project scheduled for completion in July 1969. Flow in the storm sewer has decreased over one million gallons per day in 1968 due to industrial in-plant process changes and reduced water use. Definite and continued progress is being made.

Operation deficiencies are an important factor in the abatement and prevention of stream pollution. This area has had to cope with high intensity rains, floods and power outages which hydraulically overload the existing sanitary sewer systems with subsequent bypass of untreated wastes to the streams. All communities are being required to provide standby power and an auxiliary unit such as a lagoon to insure at least disinfection and primary settling of all bypass flows. Such facilities have been completed by five communities: Flossmoor, Crete, Steger, Richton Park and Woodhill; the Sanitary District of Bloom Township and Olympia Fields are under construction and construction will start in the near future at Homewood and Thornton.

This report includes tables summarizing the results of stream water quality analyses for Thorn Creek and portions of the Little Calumet River through 1967 and June 1968. These summaries indicate a slight increase in chlorides and sulfates but a decrease in phosphates reflecting the increased industrial activity in the area and the improvements made at some industries. The decrease in Fecal Coliform can be attributed to the effluent disinfection program although periodic equipment failures, etc. still result in high counts in individual samples from the treatment plants. The Little Calumet River samples reflect some flow from Indiana. Maximum benefit of improvements and pollution control activities will not be reflected by stream water quality tests until the Homewood and Sanitary District of Bloom Township sewage works expansion and improvement projects are completed in 1969 or 1970.

The Sanitary Water Board, the industries and the municipalities are conducting a program of waste treatment control, facility improvement and operation efficiency within the limits of present technology. Equipment delivery, lack of construction personnel and financing problems are a cause of concern.

Submitted by____________________________
C. W. Klassen
Technical Secretary
ILLINOIS SANITARY WATER BOARD

STATUS OF MUNICIPAL SEWAGE TREATMENT WORKS

December 11, 1968

	CONNECTED POPULATION	TYPE OF TREATMENT	STREAM	COMMENTS
LANSING	21,000	Trickling Filter Temporary Chlorination	Little Calumet River	Site purchased, permanent Cl_2 & STP improvement under study
THORNTON	4,000	Trickling Filter Temporary Chlorination	Thorn Creek	Construction to start on permanent Cl_2, two-day lagoon
BLOOM TOWNSHIP	75,000	Activated Sludge Temporary Chlorination	Thorn Creek	STW expansion, permanent Cl_2 75% complete, to be operational by July 1969
FLOSSMOOR	5,921	Trickling Filter, 2-day lagoon, Permanent Cl_2	Butterfield Creek	- - - -
HOMEWOOD	17,400	Trickling Filter Temporary Chlorination	Butterfield Creek	STP project, including permanent Cl_2, lagoon to start 1969
OLYMPIA FIELDS - GRAYMOOR	500	Sand Filter Temporary Chlorination	Butterfield Creek	To be abandoned March 1969 Project 75% complete
" " - WOODS	1,500	Trickling Filter Temporary Chlorination	Butterfield Creek	2-day lagoon, permanent Cl_2 under const., to be completed March '69
" " - KEDZIE	2,500	Trickling Filter Temp. Chlorination	Butterfield Creek	Supplemental treatment under study
RICHTON PARK	1,400	Activated Sludge, perm. Cl_2,stab. polishing pond	Butterfield Creek	- - - -
CRETE	3,800	Trickling Filter, Perm. Cl_2, 2-day lagoon	Deer Creek	- - - -

	CONNECTED POPULATION	TYPE OF TREATMENT	STREAM	COMMENTS
WOODHILL SUBDIVISION	1,500	Activated Sludge, Perm. Cl_2, 2-day lagoon	Deer Creek	- - - -
LINCOLNSHIRE COUNTRY CLUB	40	Activated Sludge Temporary Chlorination	Deer Creek	Permanent Cl_2 and lagoon under design
CRETE. GREENBRIAR SUB.	30	Activated Sludge, Temp. Cl_2, Polishing Pond	Deer Creek	- - - -
STEGER	6,500	Activated Sludge, 2-day Pond, Perm. Cl_2	Thorn Creek	- - - -

MEMORANDUM

SUBJECT: CALUMET AREA - LAKE MICHIGAN STATUS REPORT
ILLINOIS - INDIANA INTERSTATE POLLUTION

TO: C. W. Klassen, Technical Secretary
ILLINOIS SANITARY WATER BOARD

The following is a summary of the action taken by the communities and industries in the Calumet Area, under Illinois Sanitary Water Board jurisdiction, to comply with the recommendations of the conferees of the 1965 Enforcement Conference.

All municipal sewage treatment works provide secondary biological treatment. Six of the twelve plants have additional facilities (polishing lagoons) in operation to provide supplemental treatment of the plant effluent and partial treatment of the raw sewage bypass flows. All plants have chlorination facilities installed and operational.

SUMMARY
(Municipal - Sanitary District - Utility Company)

SANITARY DISTRICT OF BLOOM TOWNSHIP
Temporary chlorination facilities are operated during warm months, utilizing final clarifier troughs and outfall for contact. Cold weather necessitates shut down of the equipment to prevent freezing. The plant expansion project is proceeding on schedule with all major concrete work complete. Permanent chlorination facilities with contact tanks should be operational by March 1969, with the entire expansion project complete by July 1969. The superintendent of the District continues to meet with representatives of the industries within the Chicago Heights area, to encourage them to connect to the Sanitary District sanitary sewer system.

CRETE (Village)
Permanent chlorination facilities and two-day polishing pond have been in operation since September 1966. Operation and maintenance is satisfactory. Infiltration continues to cause hydraulic overload of the plant at times, but all bypass flow receives at least chlorination and settling in the lagoon.

CRETE - GREENBRIAR SUBDIVISION
Plant includes extended aeration activated sludge, polishing pond and chlorination. Operation and maintenance remains satisfactory. All bypass flows receive chlorination and primary treatment in lagoon.

FLOSSMOOR (Village)
Permanent chlorination and two-day polishing pond in operation since July 1966. All bypass flows receives primary treatment in lagoon and chlorination prior to discharge to Butterfield Creek. Village engineers still are preparing report on adequacies of treatment plant to determine need for expansion and improvement project. Plant is at design capacity; operation and maintenance is satisfactory.

HOMEWOOD (City)
Temporary chlorination facilities using final tanks for contact have been in operation since March 1966. Coagulant aids are being added to the raw sewage and have greatly improved the quality of the effluent discharged to Butterfield Creek. Final plans and specifications have been submitted to the Sanitary Water Board for permit to construct expansion and improvement facilities. Operation and maintenance of existing sewage treatment facilities is satisfactory. Proposed facilities will include stand-by power generator, permanent chlorination and aerated lagoon to insure proper treatment of design flows and disinfection and settling of all bypass flows.

LANSING (Village)
Temporary chlorination facilities using final tanks for contact have been in operation since September 1966. The Village has obtained site for plant improvement project. Operation and maintenance remains excellent.

OLYMPIA FIELDS (Village)
Temporary chlorination facilities have been in operation at all three plants since March 1966. Construction progressing on lift station, force main project which will connect Graymoor area to Woods plant and permit removal of Graymoor plant; completion of project scheduled for March 1969. The improvement project at the Woods plant which includes permanent chlorination, stand-by power source and two-day lagoon, will be complete by March 1969. Operation and maintenance at the three plants is not entirely satisfactory but the effluent remains within current requirements.

RICHTON PARK (Village)
Permanent chlorination facilities are operational. The existing facilities which include a lagoon for polishing and treatment of bypass flows are well maintained and operating satisfactorily. Infiltration of ground and surface water continue to overload sanitary sewer system during periods of rain or thaw. The Village is surveying their systems to locate and eliminate these extraneous flows.

STEGER (Village)
Permanent chlorination facilities and two-day polishing pond have been in operation since OCtober 1966. All bypass flows receive primary treatment in lagoon and chlorination. Operation and maintenance is satisfactory.

THORNTON (Village)
Temporary chlorination facilities utilizing final tank for contact have been in operation since April 1966. Contract has been let for construction of two-day polishing pond and permanent chlorination facilities. Operation and maintenance of existing facilities has been greatly improved and is now very satisfactory.

WOODHILL UTILITIES COMPANY
Permanent chlorination facilities and two-day effluent polishing pond are in operation. Operation and maintenance is satisfactory.

INDUSTRIES WITH DIRECT DISCHARGE

INTERNATIONAL MINERAL AND CHEMICAL CORPORATION

All flow is discharged to the sanitary sewer system tributary to the Sanitary District of Bloom Township sewage treatment facilities. There is no longer any discharge to Third Creek from this industry.

CERTAIN-TEED PRODUCTS

Closed system for the industrial wastes is complete with no discharge of industrial waste to Third Creek. All sanitary wastes discharge to the sanitary sewer system tributary to the Sanitary District of Bloom Township sewage treatment facilities.

CHICAGO HEIGHTS - STATE STREET DITCH

Reports submitted by City of Chicago Heights indicate that Calumet Steel Company, Stauffer Chemical Company, Owens Illinois Glass Company, Columbia Tool Steel Company, will not have in-plant improvements complete by December 31, 1968 because of delay in equipment delivery, etc. Industrial waste discharge to Third Creek has been decreased approximately a million gallons per day in 1968. This has been accomplished by (1) water re-cycling in some of the industries, (2) decrease in water use due to change in plant operation, and (3) discharge of industrial waste to the Sanitary District of Bloom Township facilities.

PREPARED BY Carl T. Blomgren
Carl T. Blomgren, Jr., San. Engr.

REVIEWED BY Benn J. Leland
Benn J. Leland
Engineer in Charge of Chicago Office

CTB:ila
(12-4-68)

SANITARY WATER BOARD WATER QUALITY PROGRAM - SUMMARY OF DATA 1968 FORM 1 PAGE 1

STATION NUMBER 02 HB DES PLAINES ADDED LITTLE CALUMET R

WENTWORTH AVE BRIDGE US FR INDIANA LINE W OF HAMMOND MILES FROM MOUTH STATION TYPE CODE 1 MILES

SAMPLE DATE YR MO DA HR	LAB NO	RIVER STAGE	SA PT	WATER TEMP -F-	FIELD DO	TURBID	SPEC C	TS MM	CHLURD	SULFAT	SUSP SOL	COD	ALKALI	HARDNS	NITRAT	PLNKTN (00)	T ACDY	OIL
68 06 19	29837				001.8	00028	00918	00551	00058	00156		00030	0216	0410	0011			
68 05 2 01P	25498		5		007.5	00017	01030	00618	00046	00224		00011	0240	0476	0010			
68 03 27 09A	22043		5	051	006.0	00018	00834	00500	00041	00204		00012	0176	0384	0006			
68 02 27 10A	32537		5	030	~~[illegible]~~							00014						
68 01 23 10A	16917		2	030	006.7	00010	01029	00617	00097	00200			0196	0404	0002			
68 01 23 10A	28132		2	030	~~[illegible]~~							00026						

	WATER TEMP	FIELD DO	TURBID	SPEC C	TS MM	CHLURD	SULFAT	SUSP SOL	COD	ALKALI	HARDNS	NITRAT
1968 YEAR NO. OF ANALYSES	4	4	4	4	4	4	4		5	4	4	4
MAXIUM VALUE	51	8.0	26	1030	618	97	224		30	240	476	11
MINIMUM VALUE	30	1.8	10	834	503	41	156		11	176	384	2
AVERAGE VALUE	35	6.0	18	952	571	60	196		18	207	418	7
MEDIAN RANGE MINIMUM VALUE	0	5.0	0	900	540	30	200		0	150	400	0
CRITERIA VALUE	90	2.0										
CHANGE IN AVERAGE FROM 1967	-17	+2.1	-106	+137	+82	+14	+34		+1	+16	+66	+0
STA/PLT NO. OF ANALYSES	40	40	45	45	45	45	12	6	7	45	45	19
MAXIMUM VALUE	90	17.3	1000	1429	857	97	250	44	30	332	620	20
MINIMUM VALUE	30	0.0	5	374	224	16	105	26	11	84	160	1
AVERAGE VALUE	53	5.3	53	893	535	47	180	37	18	211	386	6
MEDIAN RANGE MINIMUM VALUE	0	5.0	20	900	540	30	160	40	0	200	300	0
CRITERIA VALUE	90	2.0										
CHANGE IN AVERAGE ~~FROM~~ to 1968	-2	+0.1	-4	+5	+3	+2	+7	+0	+1	+0	+3	+0

26L

SANITARY WATER BOARD WATER QUALITY PROGRAM - SUMMARY OF DATA 1968 FORM 2 PAGE 1

STATION NUMBER 02 HB DES PLAINES ADDED LITTLE CALUMET R

WENTWORTH AVE BRIDGE DS FR INDIANA LINE V OF HAMMOND MILES FROM MOUTH STATION TYPE CODE 1 MILES

SAMPLE DATE YR MO DA	LAB NO	AMMON	ORTHO	TOT PH	PH	MBAS	FLUOR	IRON	MAGNESE	BOD	PHENL	CYNIDE	ALPHA	BETA	COLIFORM	F STREP	F COLI
68 06 19	29837			13.2	05.4	00.6							0000	0011	00200000		
68 05 2	25498	01.5		03.0	08.0	00.6					0000	00.00	0001	0010			00000100
68 03 27	22043	01.4		02.0	07.9	00.4					0000	00.00	0000	0011			00002000
68 02 27	32537	10.0				00.9						00.00					
68 01 23	16917			10.5	07.7					0008			0002	0009	00400000	00015000	00042000
68 01 23	28132	06.3				00.9					0005	00.00					
YEAR NO. OF ANAL		4		4	4	5				1	3	4	4	4	2	1	3
MAXIMUM VALUE		10.0		13.2	8.0	0.9				8	5	0.00	2	11	400000	15000	42000
MINIMUM VALUE		1.4		2.0	5.4	0.4				8	0	0.00	0	9	200000	15000	100
AVERAGE VALUE		4.8		7.1	7.2	0.6				8	1	0.00	0	10	300000	15000	14700
MEDIAN RANGE		1.5		3.0	7.7	0.6				7	0	0.00	0	10	6000	500	2000
CRITERIA VALUE		1.5			6.5	0.5				10	.02	.025		500	5000	500	
CHANGE IN AVERAGE		+1.9		-8.0	-0.4	+0.3				-6	-4	+0.00	+0	+0	-272336	-1381	-70033
STA/PLT NO. ANAL		6	13	11	45	45		2		40	5	4	43	44	43	40	6
MAXIMUM VALUE		10.0	8.5	32.0	8.4	25.0		0.8		39	5	0.00	2	150	3600000	98000	200000
MINIMUM VALUE		1.4	0.5	0.1	5.4	0.0		0.5		3	0	0.00	0	0	28	0	100
AVERAGE VALUE		4.1	2.7	9.5	7.6	1.0		0.6		11	3	0.00	0	13	408628	6373	49716
MEDIAN RANGE		2.5	2.0	4.5	7.7	0.5		0.8		7	5	0.00	0	10	6000	500	2000
CRITERIA VALUE		1.5	~~1.5~~		6.5	0.5				10	.02	.025		~~500~~	5000	500	
CHANGE IN AVERAGE		+1.2	+0.0	-1.3	-0.1	+0.0		+0.0		+0	-2	+0.00	+0	+0	-5299	+221	-35017

26M

SANITARY WATER BOARD   WATER QUALITY PROGRAM - SUMMARY OF DATA 1968   FORM 1   PAGE 1

STATION NUMBER 01 HHD   DES PLAINES ADDED LITTLE CALUMET R   THORN CK

167TH ST BRIDGE E OF CALUMET EXPRESSWAY   MILES FROM MOUTH   STATION TYPE CODE 2 0687 1 MILES

SAMPLE DATE YR MO DA HR	LAB NO	RIVER STAGE	SA PT	WATER TEMP -F-	FIELD DO	TURBID	SPEC C	TS MM	CHLORD	SULFAT	SUSP SOL	COD	ALKALI	HARDNS	NITRAT	PLNKTN (00)	T ACDY	OIL
68 06 19	29836				001.4	00006	02462	01477	00358	00420		00028	0324	0620	0000			
68 05 2 02P	25501		5		~~[illegible]~~	00036	02039	01223	00254	00415		00034	0316	0620	0003			
68 03 27 10A	22044		5	054	004.6	00006	01401	00841	00155	00252		00004	0216	0468	0004			
68 01 9 10A	15830				~~[illegible]~~	00025	02148	01289	00273	00405			0316	0534	0002			
68 01 9 10A	26218		2		~~[illegible]~~							00027						
1968 YEAR NO. OF ANALYSES				1	2	4	4	4	4	4		4	4	4	4			
MAXIUM VALUE				54	4.6	36	2462	1477	358	420		34	324	620	4			
MINIMUM VALUE				54	1.4	6	1401	841	155	252		8	216	468	0			
AVERAGE VALUE				54	3.0	18	2012	1207	260	373		24	293	573	2			
MEDIAN RANGE MINIMUM VALUL				0	1.0	0	1000	600	150	240		0	300	500	0			
CRITERIA VALUE				90	2.0		1000	540					200		0			
CHANGE IN AVERAGE FROM 1967				+3	-1.6	+5	+388	+227	+61	+102		-638	+37	+109	-6			
STA/PLT NO. OF ANALYSES				36	36	49	49	49	49	14	10	9	49	49	21			
MAXIMUM VALUE				90	13.0	270	2614	1568	428	562	102	1924	560	720	28			
MINIMUM VALUE				23	0.4	5	842	505	63	110	29	8	112	0	0			
AVERAGE VALUE				55	4.9	29	1768	1062	216	300	52	239	255	532	5			
MEDIAN RANGE MINIMUM VALUE				0	4.0	0	1000	600	150	240	40	0	250	500	0			
CRITERIA VALUE				90	2.0		1000	540					200		0			
CHANGE IN AVERAGE ~~FROM~~ to 1968				+0	-0.1	-1	+22	+13	+4	+29	+0	-173	+3	+4	-1			

SANITARY WATER BOARD WATER QUALITY PROGRAM – SUMMARY OF DATA 1968 FORM 2 PAGE 1

STATION NUMBER 01 MBD DES PLAINES ADDED LITTLE CALUMET R THORN CK

167TH ST BRIDGE E OF CALUMET EXPRESSWAY MILES FROM MOUTH STATION TYPE CODE 2 0687 1 MILES

SAMPLE DATE YR MO DA	LAB NO	AMMON	ORTHO	TOT PH	PH	MBAS	FLUOR	IRON	MAGNESE	BOD	PHENL	CYNIDE	ALPHA	BETA	COLIFORM	F STREP	F COLI
68 06 19	29836			35.0	08.1	01.2							0000	0020	00098000		
68 05 2	25501	13.0		62.0	08.1	01.2					0000	00.00	0000	0019			00004200
68 03 27	22044			25.0	07.8	00.7							0000	0011			00012000
68 01 9	15830			78.0	07.9					0010			0000	0012	00100000	00011000	00031000
68 01 9	26218	15.0				00.2					0013	00.00					
YEAR NO. OF ANAL		2		4	4	4				1	2	2	4	4	2	1	3
MAXIMUM VALUE		15.0		78.0	8.1	1.2				10	13	0.00	0	20	100000	11000	31000
MINIMUM VALUE		13.0		25.0	7.8	0.2				10	0	0.00	0	11	98000	11000	4200
AVERAGE VALUE		14.0		50.0	7.9	0.8				10	6	0.00	0	15	99000	11000	15733
MEDIAN RANGE		5.0		4.5	7.7	0.6				10	0	0.00	0	10	6000	500	2000
CRITERIA VALUE		1.5			6.5	0.5				10	.02	0.025		~~1000~~	5000	500	~~400~~
CHANGE IN AVERAGE		+4.0		-2.0	+0.2	+0.3				+3	-8	+0.00	+0	+4	-310500	+4584	+3233
STA/PLT NO. ANAL		4	17	11	49	49		2		44	4	3	49	49	45	44	6
MAXIMUM VALUE		15.0	50.0	90.0	8.2	30.0		0.9		32	18	0.00	5	109	4100000	24000	34000
MINIMUM VALUE		6.0	2.6	3.5	6.7	0.0		0.5		3	0	0.00	0	0	14000	20	1500
AVERAGE VALUE		12.0	16.5	42.8	7.7	1.3		0.7		8	10	0.00	0	15	390222	4729	14116
MEDIAN RANGE		5.0	3.5	4.5	7.7	0.6		0.8		7	5	0.00	0	10	6000	500	2000
CRITERIA VALUE		1.5	~~1.5~~		6.5	0.5		1.4		10	.02	0.025		~~1000~~	5000	500	~~600~~
CHANGE IN AVERAGE		+2.0	+0.0	+4.1	+0.1	-0.1		+0.0		+0	-4	+0.00	+0	+0	-13545	+146	+1616

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                        SANITARY WATER BOARD          WATER QUALITY PROGRAM - SUMMARY OF DATA   1968        FORM 1     PAGE     1
                      STATION NUMBER  04    HR        DES PLAINES ADDED  LITTLE CALUMET R
159TH ST-US6 BR E OF CALUMET EXPRESS GAG STA
                                                                     MILES FROM MOUTH         STATION TYPE CODE 1            MILES

SAMPLE                                                                                                                                 
 DATE             LAB  RIVER SA WATER  FIELD TURBID  SPEC C   TS    CHLORD SULFAT   SUSP    COD  ALKALI HARDNS NITRAT PLNKTN T ACDY    OIL
YR MO DA  HR       NO  STAGE PT  TEMP    DO                   MM                    S L                                 (00)
                                 -F-

68 06 19         29839                 001.9  00008  01905  01143  00258  00300          00032   0292   0520   0003
68 05  2 12P     25500          5      007.1  00027  01699  01019  00180  00390          00030   0296   0572   0006
68 03 27 08A     22041          5  052 004.8  00008  01221  00733  00117  00236          00013   0184   0448   0007
68 02 27 09A     32540          5  034 [illegible]                                               00021
68 01 23 09A     16919          5  033 005.7  00006  01559  00935  00225  00330                  0196   0472   0003
68 01 23 09A     28134          5  033 [illegible]                                               00022


1968 YEAR NO. OF ANALYSES           4     4      4      4      4      4      4             5      4      4      4
   MAXIUM VALUE                    52   7.1     27   1905   1143    258    390            32    296    572      7
   MINIMUM VALUE                   33   1.9      6   1221    733    117    236            13    184    448      3
   AVERAGE VALUE                   38   4.8     12   1596    957    195    314            23    242    503      4

   MEDIAN RANGE MINIMUM VALUE       0   4.0      0   1000    600    150    240             0    150    400      0
   CRITERIA VALUE                  90   2.0

   CHANGE IN AVERAGE FROM 1967     -8  +1.2     -1   +178   +107    +31   +102            +2    +31    +44     -2



   STA/PLT NO. OF ANALYSES         31    28     33     33     33     33     13      7      8     33     33     19
   MAXIMUM VALUE                   76  14.0    380   2317   1390    335    410     94     40    420    592     15
   MINIMUM VALUE                   24   0.4      5    659    395     40    100     36     13    132    244      1
   AVERAGE VALUE                   53   4.3     39   1469    881    171    242     60     25    226    468      6

   MEDIAN RANGE MINIMUM VALUE       0   3.0      0   1000    600    150    200     40      0    200    400      0
   CRITERIA VALUE                  90   2.0

   CHANGE IN AVERAGE ~~FROM~~ to 1968  -2  +0.1   -4    +17    +10     +3    +32     +0     -2     +3     +4     +0
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SANITARY WATER BOARD   WATER QUALITY PROGRAM - SUMMARY OF DATA   1968   (FORM 2)   PAGE   1

STATION NUMBER 04 HR   DES PLAINES ADDED LITTLE CALUMET R

159TH ST-US6 BR E OF CALUMET EXPRESS GAG STA   MILES FROM MOUTH   STATION TYPE CODE 1   MILES

SAMPLE DATE YR MO DA	LAB NO	AMMON	ORTHO	TOT PH	PH	MBAS	FLUOR	IRON	MAGNESE	BOD	PHENL	CYNIDE	ALPHA	BETA	COLIFORM	F STREP	F COLI
68 06 19	29839			22.5	07.3	01.1							0000	0010	00200000		
68 05. 2	25500	09.0		44.0	07.9	01.1					0000	00.90	0000	0017			00002000
68 03 27	22041	01.8		16.0	07.6	00.7					0000	00.00	0000	0011			00005000
68 02 27	32540	18.0				01.3						00.00					
68 01 23	16919			37.0	07.8					0011			0000	0009	00200000	00008000	00050000
68 01 23	28134	09.0				01.1					0004	00.00					
YEAR NO. OF ANAL		4		4	4	5				1	3	4	4	4	2	1	3
MAXIMUM VALUE		18.0		44.0	7.9	1.3				11	4	0.00	0	17	200000	8000	50000
MINIMUM VALUE		1.8		16.0	7.3	0.7				11	0	0.00	0	9	200000	8000	2000
AVERAGE VALUE		9.4		29.8	7.6	1.0				11	1	0.00	0	11	200000	8000	19000
MEDIAN RANGE		5.0		4.5	7.0	0.8				10	0	0.00	0	10	6000	500	2000
CRITERIA VALUE		1.5			6.5	0.5				10	.02	.025		[illegible]	5000	500	
CHANGE IN AVERAGE		+2.7		-10.0	-0.1	+0.5				+4	-5	+0.00	+0	+0	-305000	+185	-6666
STA/PLT NO. ANAL		6	12	8	33	34				28	5	5	33	33	30	30	6
MAXIMUM VALUE		18.0	35.0	75.0	8.1	1.6				41	7	0.00	3	108	10000000	21000	55000
MINIMUM VALUE		1.8	2.9	4.2	7.2	0.0				2	0	0.00	0	0	4000	60	2000
AVERAGE VALUE		8.5	12.1	34.8	7.7	0.6				9	3	0.00	0	16	784000	4840	22333
MEDIAN RANGE		5.0	3.5	4.5	7.7	0.6				7	3	0.00	0	10	6000	500	2000
CRITERIA VALUE		1.5	[illegible]		6.5	0.5				10	.02	.025		[illegible]	5000	500	
CHANGE IN AVERAGE		+1.8	+0.0	-5.0	+0.0	+0.1				+0	-3	+0.00	+0	+0	-41714	+109	-3333

26Q

MR. STEIN: Are there any other comments or questions?

If not, I notice that a long-time colleague, Dr. Clare Boruff, the Industrial Representative on the Illinois Sanitary Water Board, just came in, used to be on the Federal Board. Dr. Boruff.

I hate to say, we are drinking water up here. I hope we are not setting a bad example. (Laughter.)

PROGRESS REPORT ON MUNICIPALITIES IN INDIANA

PERRY E. MILLER, ASSISTANT DIRECTOR,
DIVISION OF SANITARY ENGINEERING,
INDIANA STATE BOARD OF HEALTH, INDIANAPOLIS, INDIANA

MR. STEIN: We will go to Indiana.

Chesterton.

MR. MILLER: Chesterton has an activated sludge plant with chlorination and was providing secondary treatment before the Conference in 1965.

MR. STEIN: In other words, they are in compliance?

MR. MILLER: Yes.

MR. STEIN: I think this would be helpful for the Conferee or anyone who is speaking for any of the industries to make that statement whether they are in compliance with the requirements or not.

Crown Point.

MR. MILLER: Crown Point is in compliance. It has an activated sludge plant with chlorination.

MR. STEIN: Dyer.

MR. MILLER: Dyer has completed new facilities since the Conference and this is a secondary treatment type plant, activated sludge with chlorination of the effluent.

MR. STEIN: In compliance?

MR. MILLER: In compliance.

MR. STEIN: East Chicago.

MR. MILLER: East Chicago has an activated sludge type plant with chlorination. It was chlorinating prior to the Conference in 1965. However, East Chicago has submitted final plans and specifications for sewer separation to serve a large urban renewal area, an adjacent area in the northeast part of the city.

Also East Chicago has completed the first phase of an advanced waste treatment project and has contracted for the construction of a three-quarter-million-gallon-a-day plant for advanced waste treatment.

In addition it has advertised for bids for a stormwater demonstration project and grants from the Federal Water Pollution Control Administration for helping to support these projects has also been submitted. I am sure that one is being supported on the advanced waste treatment project. And it is in compliance with the requirements of the Conference.

MR. STEIN: East Chicago, I take it, with these other projects, has gone beyond the bare requirements of the Conference. Now, as you well know, there are other problems here beyond secondary treatment, stormwater disposal and other things, that some of the municipalities and the industries are recognizing here. But what we are doing is checking here just the requirements of the Conference.

East Gary, the Miller Plant.

MR. MILLER: East Gary has a trickling filter plant with chlorination, and is in compliance with the Conference requirements.

MR. STEIN: Gary Sanitary District.

MR. MILLER: Gary Sanitary District has had an expansion of its facilities, but it has an activated sludge type plant with chlorination.

Also in Gary, Gary has retained a consulting engineer for preliminary report on the needs for sewage treatment improvements, including planning for advanced waste treatment and phosphate reduction, and is in compliance with the requirements of the Conference.

MR. STEIN: Griffith.

MR. MILLER: Griffith is connected to the Hammond Sanitary District Sewer System and is in compliance with the requirements of the Conference.

MR. STEIN: Hammond Sanitary District.

MR. MILLER: Hammond Sanitary District has an activated sludge type plant with chlorination of the effluent. Hammond and Whiting have stormwater discharges on Lake Michigan and we have indicated that they must by 1970 provide for the control and disinfection of the stormwater discharges to Lake Michigan.

Also the Hammond Sanitary District has preliminary engineering report on proposed plant improvements and for sewer separation and disinfection of the stormwater discharges.

And I might say that the Hammond Sanitary District plant is one of the factors in the water quality in the Grand Calumet River, and certainly we have indicated in past reports and indicate here that these improvements are needed if we are to meet the water quality criteria that has been established.

However, insofar as the Conference requirements for secondary type treatment and chlorination, Hammond is providing this treatment.

MR. STEIN: Highland.

MR. MILLER: Highland is now connected to the Hammond Sanitary District and is complying with the requirements of the Conferees.

MR. STEIN: Hobart.

MR. MILLER: Hobart has the secondary treatment type plant with activated sludge and chlorination and is meeting the requirements of the Conference.

MR. STEIN: Lincoln Gardens.

MR. MILLER: Lincoln Gardens and also this Ross Township and St. John Township are listed in our semi-public plants. I don't have these itemized, but the semi-public plants, these are the schools, the subdivisions, shopping centers, trailer parks, this sort of thing, we have 18 of these that are providing effluent chlorination, 1 plant that has such facilities under construction, 5 that have 7-day terminal lagoons as part of the treatment works,and 4 that are making improvements. I might say along this line, we have had five plants of this type that have been abandoned and are now connected to the Merrillville Conservancy District and are going to the Gary Sanitary District for treatment and that there are two plants that have been abandoned that are now connected also to the Dyer system.

So with the exception of the one semi-public that is constructing chlorination facilities at this time, the semi-publics are in compliance with the requirements of the Conference.

MR. STEIN: That should take care of Lincoln Gardens, Ross Township and St. John, shouldn't it?

MR. MILLER: Right.

MR. STEIN: Porter.

MR. MILLER: Porter does not have treatment at this time. It is under order of the Stream Pollution Control Board to provide it. The town has sold bonds and let contracts to connect up to the Chesterton sewer system, so that when this work is completed it will be in compliance at the present time.

MR. STEIN: When will this take place?

MR. MILLER: Mr. Poole says four to six months. Actually, I don't--

MR. STEIN: Once they sold their bonds. It is costing them money during the time they wait.

MR. POOLE: Yes. This has been a rough one to get off the ground. One month they were going with Chesterton, the next month they were going to build their own sewage treatment plant. But they finally signed the agreements and sold the bonds and the contracts are let. I don't know how many feet of sewer is involved to connect it up.

That four to six months is a guess on my part, but I think it is a fairly reasonable guess.

MR. STEIN: Let's go to Schererville.

MR. MILLER: Schererville built a new activated sludge plant with chlorination since the Conference in 1965 and is now in compliance with the Conference requirements.

MR. STEIN: Valparaiso.

MR. MILLER: Valparaiso has an activated sludge plant with chlorination and is in compliance with the requirements of the Conference.

MR. STEIN: That completes the list of the Indiana municipalities. And I think it is fair to say that Indiana is in compliance. There is one town, Porter, not in compliance. Indiana has taken full legal action under its State law and the community is on its way. So I think for that municipal program, as far as we can see, unless there is some other comment, that they seem to be in compliance.

Yes.

MR. KLASSEN: I just had one other question, Mr. Chairman. I recall at the original meeting in March of 1965 the point was raised on Gary concerning the amount of combined flow that was put through the Gary plant before bypassing started. I wondered if we have any information on that.

As I recall, the entire capacity of the Gary plant was not being utilized prior to the bypassing of combined flow into the outlet stream, and our concern was that the outlet stream came into Illinois.

MR. MILLER: I don't believe the outlet stream from Gary comes into Illinois. This goes out the Indiana Harbor canal. But the plant has been enlarged since the original meeting of the Conference and we now have a different operation in Gary than we had at the time of the Conference, and I am certain that Gary is handling up to the capacity of the plant stormwater flows.

MR. KLASSEN: Isn't there a combined sewer overflow in South Gary that goes into a stream that comes into Illinois?

MR. MILLER: Not that I know of from Gary. It would be in the Little Calumet, but the divide, I think, would be west.

MR. KLASSEN: It is in the Little Calumet?

MR. MILLER: Yes, but the divide would go west from Gary--or east, I mean.

MR. POOLE: It goes to Burns Ditch.

MR. POSTON: You can see the map there.

MR. KLASSEN: I know. I know. I am aware of that. But as I recall, this was a controversial point that I had with Mr.Matthews, who is the manager there. But if Gary is in compliance, I will just drop the comment. I was just interested.

MR. STEIN: All right, let's see if we can pick up the three Illinois places that are under the jurisdiction of the District, Chicago M.S.D., Mr. President.

Calumet Plant.

PROGRESS REPORT ON THE CALUMET PLANT
JOHN E. EGAN, CONFEREE AND PRESIDENT,
METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO,
CHICAGO, ILLINOIS

MR. EGAN: I can report on the Calumet Plant. I just checked with Mr. Bacon. It is in compliance and also using chlorination.

MR. STEIN: The chlorination is working?

MR. EGAN: Completed, oh, along about July. And it is working.

MR. STEIN: All right.

Hazel Crest?

MR. EGAN: I don't have that.

MR. STEIN: There were two towns, evidently, Hazel Crest and Matteson,that are on our list.

MR. EGAN: Mr. Bacon will bring back the report on them later.

MR. STEIN: Oh. Well, we can pass that.

MR. EGAN: Yes. He has the list now and he is checking on it.

MR. STEIN: All right.

MR. POOLE: One question, Mr. Chairman.

MR. STEIN: Yes.

MR. POOLE: You are talking about chlorination of the Calumet Plant, Mr. Egan, you said July. Do you mean July 1968?

MR. EGAN: 1968, yes.

MR. POOLE: All right.

MR. STEIN: At this point I think we will take a recess.

Before we do, I am looking at the industries, and if you have to check on the plants, there are a good many of the industries we have under Illinois that are listed under the M.S.D. Rather than go through the list and not get any responses until later, if this is the situation, I suggest we think about that and then we can call on Indiana first if M.S.D. is going to need some more time in order to prepare the report.

MR. EGAN: Mr. Bacon has the list; he is getting the information now. He will bring it back, and I would suggest you call on Indiana first.

MR. STEIN: Right.

We will stand recessed for 15 minutes.

(RECESS)

MR. STEIN: Let's reconvene.

I think before we get into the industries, we will go through the Federal installations.

Let me call these:

Indiana Harbor Light Station. Mr. Poston, who are you going to have report on that?

MR. POSTON: I am going to ask Mr. Riley to comment on these.

PROGRESS REPORT ON FEDERAL INSTALLATIONS

WILLIAM J. RILEY, SANITARY ENGINEER, FWPCA,
GREAT LAKES REGION, CHICAGO, ILLINOIS

MR. STEIN: Indiana Harbor Station, Mr. Riley.

MR. RILEY: The Indiana Harbor Light Station, operated by the Coast Guard, has a secondary treatment plant with chlorination and is in compliance.

MR. STEIN: DMS Depot, GSA, at Hammond, Indiana.

MR. RILEY: The Defense Materiel Supply Depot, Hammond, Indiana, discharges sanitary wastes to the ground by sub-surface disposal means and cooling water from humidification and air conditioning to Wolf Lake with no treatment. However, the Depot is in compliance with Conference recommendations.

MR. STEIN: All right, let's go down these NIKE sites. CG-47 at Wheeler, Indiana.

MR. RILEY: You might take those in total. They have all got very similar flows--

MR. STEIN: I know, but let's go down them one at a time.

MR. RILEY: All right.

MR. STEIN: If we go on these in total, we can do it on all these. I think we just have to do it this way.

CG-47, Wheeler, Indiana.

MR. RILEY: Chicago area NIKE site 47, Wheeler, Indiana, has secondary treatment facilities. Chlorination facilities were installed in the last year. That site is now in compliance.

MR. STEIN: CG-32, Chesterton.

MR. RILEY: Again secondary treatment with chlorination which was installed within the last year and is now in compliance.

MR. STEIN: CG-45 in Gary.

MR. RILEY: Site 45 in Gary has secondary treatment facilities and chlorination and is in compliance.

MR. STEIN: CG-46, Munster, Indiana.

MR. RILEY: Site 46 has secondary treatment facilities and chlorination and is in compliance.

MR. STEIN: Naval Reserve Training Center in Gary.

MR. RILEY: Discharges sanitary wastes to the ground by sub-surface means. It is in compliance.

MR. STEIN: What do you mean, has a septic field?

MR. RILEY: Septic tank entirely.

MR. STEIN: Right. T. J. O'Brien Lock and Dam, Illinois, Cook County.

MR. RILEY: O'Brien Lock and Dam has their facilities discharging to septic tank drain field system and is in compliance.

MR. STEIN: Are there any comments or questions?

MR. POSTON: I note that everything seems to be in compliance in all Federal installations. How do you know this? What have you done to see--

MR. RILEY: By saying that they are in compliance I am saying that they are in compliance in providing the facilities required by the Conference. Within the last year we have maintained surveillance over those facilities discharging to surface waters in the Conference area.

The results of this surveillance have indicated in numerous instances poor operation of these facilities. On one occasion at the Coast Guard station in Indiana Harbor a site visit revealed that the package sewage treatment plant was shut off on numerous occasions.

MR. POSTON: In other words, they are not even operating the plant that is in compliance?

MR. RILEY: It wasn't at the time. Since that time our people have adjusted the operation of it, taking samples to find that they can do the job if operated. But these agencies have a lot of difficulty getting good operation.

MR. POSTON: Adequacy as to size of treatment plant, how does this work out? Are there plants that need expansions?

MR. RILEY: In every one of these cases

treatment facilities from the capacity standpoint are more than they now need. The stations are not growing. In fact, the population is decreasing. Many of these NIKE sites are being--

MR. POSTON: But they do have problems in operation such as--

MR. RILEY: They have distinct problems in operation.

MR. POSTON: --bypassing it entirely? How about when they are operated, do they operate--

MR. RILEY: These are small plants. There is minimal laboratory control exercised over the plants. Analyses on many of the stations are only taken once a year and they are expected to be automatic, but they aren't.

MR. KLASSEN: May I ask a question? To whom do you submit monthly operation reports?

MR. RILEY: On these installations?

MR. KLASSEN: Yes.

MR. RILEY: There are no monthly operation reports submitted by us and we have received none from the installations.

MR. KLASSEN: Maybe this isn't the place

to raise it, but it would seem to me, and this is a point in the State of Illinois, that they should be submitting operation reports as Federal installations either to the State in which they are located or to the Federal water pollution agencies so the State in turn will know what you are doing. We require these of our own plants. This is why I raised the question.

MR. STEIN: How about that, Mr. Riley? Can we get these?

MR. RILEY: We can get them. I think-- well, it is going to be difficult to get because of the fact that presently they are not conducting any analyses in the normal terms.

MR. STEIN: Well, then, I think the States should know this.

MR. RILEY: Right.

MR. STEIN: You may or may not recall, we had several discussions with all the State and district Conferees here about plant records within their State and the availability to us of the records, and Illinois and Indiana and the district all complied. And I will say that--

MR. RILEY: Well, let me say this.

MR. STEIN: --on the basis of my experience that we have never gone to any of these public jurisdictions and asked for any record that wasn't given to us and given to us without any reservations. And I think they are entitled to some reciprocity.

MR. RILEY: For instance, in this Conference area, the principal waste discharges from the standpoint of quantity of flow are from the four NIKE sites in the Conference area. We have requested operation reports from the Army at these locations and at others within our region and have been told that the submission of monthly or any periodic operation reports to anyone is against the Department of Army regulations. We have been trying to get this rescinded, but thus far have had no success.

MR. KLASSEN: Do any of these discharge directly into the lake or all of them?

MR. RILEY: As far as the NIKE sites, none of them directly to the lake.

MR. STEIN: What regulation is that against?

MR. RILEY: AR 11-21.

MR. STEIN: Is anyone here from the Army?

MR. RILEY: I don't know.

MR. STEIN: If this is so, if it is against regulations--I would like to see their regulation in the record. I guess that regulation isn't secret, is it?

LT. SCHEIBLE: I don't have a copy of the regulation with me so I can't very well put it in the record at this point.

MR. STEIN: No. But we will leave the record open. It is your view that operation reports are against Army regulations?

MR. RILEY: Periodic operation reports.

MR. STEIN: What?

MR. RILEY: Periodic submission of operation reports.

MR. STEIN: Are against Army regulations?

LT. SCHEIBLE: This is correct.

MR. STEIN: Let's have your name. Can you possibly give us the reason for that?

MR. KLASSEN: Please, Mr. Stein, I know Bob, and he is only a Second Lieutenant. (Laughter.)

LT. SCHEIBLE: My name is Robert E. Scheible. I am Chief Sanitary Engineer for headquarters, Fifth United States Army.

The establishment of the Department of the Army policy is not within my purview, so I cannot explain necessarily why the Department of the Army has established certain policies.

However, I think the record should note that the Department of the Army and the--well, actually it is the Department of the Defense and The Department of the Interior have reached a memorandum of understanding. So far as I know, this includes the fact that monthly operating reports will not be submitted.

MR. STEIN: Well, we will take this up.

(Off the record.)

MR. KLASSEN: May I make a suggestion based on my own Army experience?

Someone within the Corps could say this, I have seen it said, "according to my interpretation of AR so-and-so these reports could be submitted." Now, this doesn't say that Army regulations say this, but this is somebody's interpretation. And if you have a high enough rank, nobody is going to question you.

Is this possible?

LT. SCHEIBLE: I can't recall the exact wording of the regulation to quote it verbatim, but my recollection is that it says that monthly operating reports will not be submitted. Not that it is my interpretation that they won't be submitted, but they will not be submitted.

It also does permit summary information to be submitted upon request by The Department of the Interior.

MR. STEIN: Here, let me again raise this point, two points. I am not asking you to speculate.

Do you have any reason to know why this is the case, the reason for that regulation?

LT. SCHEIBLE: On the record or off the record?

MR. STEIN: Off the record.

(Off the record.)

MR. STEIN: O. K. We have had this before. If this is in fact the reason, and that is in fact a valid one, we have had that issue before, and as a matter of fact I defended the Army's position on this when they indicated that this was their reason, for national security, in the Missouri River enforcement actions, and particularly with the Sioux City Air Force

Base at the time.

However, as I understood this, we have the million gallons a day here, and the issue then was that you can make your judgment if you get the millions of gallons a day in sewage. What else is that analysis going to give? You see, this is a very difficult part of the situation.

The other is, I think that we have made requests to industries and cities and others who have always said they would be delighted to give us summary information too, and the States and the Sanitary District and we have not been satisfied with it, we want detailed information.

I would suggest that if the States want a complete report, we are faced with two alternatives, and that is that either we are going to get these operational reports or we may have to put in someone like Riley or someone who is cleared to make periodic inspections a lot more frequently than they are now and someone that the State and our people know, and impartially, and make a very detailed report. Ordinarily once the reliability of an operator of facility is adopted, it is much cheaper for the taxpayer if you can take his detailed reports and look at it without having a man sitting there all the time, better for all concerned.

But if this is the situation, we may just have to look for another method to get this.

LT. SCHEIBLE: Well, again this would be something that should be brought up at Department of the Army and Department of the Interior levels. Down at the local level we by necessity must follow the guidance that is put out to us by the Department of the Army, and if they say you will or you won't do these, then frankly we will or we won't.

Now, Mr. Stein, did I understand you correctly that you wanted a copy of the Army regulation?

MR. STEIN: Yes, in the record.

LT. SCHEIBLE: Bill, do you not have a copy of AR 11-21?

MR. RILEY: I have got a copy.

MR. STEIN: All right, let's have that submitted in the record and let the record show that we cannot get that under terms of Army regulation.

(The following regulation was furnished by the Department of the Army for inclusion in this record:)

ARMY REGULATION
No. 420-46

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *8 October 1965*

REPAIRS AND UTILITIES

WATER AND SEWERAGE

Paragraph
Purpose 1
Applicability 2
General 3
Cooperation with State and local authorities 4
Operation of water supply and sewage disposal systems 5
Chlorination of water 6
Bacteriological examination of water 7
Water softening 8
Scale and corrosion control 9
Safeguarding terminal water supplies 10
Water-level gages for wells 11
Meters 12
Chemical analyses of water supplies 13
Chlorination of sewage 14
Swimming pools 15
Records 16

1. Purpose. This regulation compliments DOD Directives 4165.2 and 6230.1 and establishes policies and procedures governing facilities used to supply water and to dispose of sewage and industrial wastes.

2. Applicability. This regulation applies to all installations and activities within the purview of AR 420-10.

3. General. Furnishing of sewerage services, operation of water and sewage pumping and treatment plants, and maintenance, repair, and alteration of facilities and appurtenances required for the production, pumping, treatment, and distribution of water, and the collection and disposal of sewage and industrial wastes are repairs and utilities activities.

a. Operation and preventive maintenance practices are prescribed in TM 5-660, TM 5-661, TM 5-662 (when published), TM 5-665 and TM 5-666.

b. Contracts for the purchase and sale of water and sewerage services will be in accordance with AR 420-80.

4. Cooperation with State and local authorities. *a. Requirements.* Cooperation will be given to civil authorities in the abatement and control of pollution of surface and underground waters by sewage and industrial wastes from installations and activities. See AR 415-105 and AR 40-5.

b. Standards. Standards relating to contamination of surface and underground waters established by U.S. Public Health Service and State agencies and applied to civilian population and industrial facilities in the vicinity will be maintained, provided such standards do not conflict with established Headquarters, Department of the Army policy. In case of conflict, the Headquarters, Department of the Army policy will govern.

c. Inspections. Representatives from U.S. Public Health Service and State agencies having statutory authority to check sanitary quality of surface and underground waters may be permitted to inspect installation sewerage facilities, examine sewage and industrial wastes treatment plant operating records, and make tests necessary to determine the quality of the effluent. They will be accompanied by appropriate technical representatives (either engineer or medical) designated by the operating agency commander (AR 420-10).

d. Reports.

(1) Major operational changes recommended in inspection reports from U.S. Public Health Service and State agencies will not be made without approval of the appropriate operating agency commander.

(2) A copy of each inspection report ((1) above) will be forwarded to the Chief of Engineers, ATTN: ENGMC-FU, De-

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*This regulation supersedes AR 420-46, 1 April 1964.

partment of the Army, Washington, D.C., 20315.

5. Operation of water supply and sewage disposal systems. *a.* Installation commanders will assign the following functions to one individual to insure coordination of operations:

(1) Operation and maintenance of the water supply, treatment, storage, and distribution facilities, including stationary fire pumps and conduct of fire flow tests.

(2) Operation and maintenance of the sewage collecting system, pumping facilities, and treatment plant.

b. The above functions will be coordinated with health and fire protection functions at the installation.

c. Accurate and complete water supply distribution system, sectional, and valve-location maps will be prepared and kept current. Easily recognized reference points with ties will be provided for the rapid location of valve boxes. A piping diagram identifying each valve and pump together with operating procedure will be posted and kept current in each pumping station. See TM 5-660 for detailed instructions.

d. A standing operating procedure for alerting personnel in national or local emergencies (enemy attack, subnormal service, main breaks, fires, etc.), and clearly defining the duty of each individual during emergencies will be prepared and kept current.

6. Chlorination of water. Installation commanders will provide facilities to accomplish chlorination of installation water supply in accordance with standards of water chlorination practice and control tests set forth in TB MED 229.

7. Bacteriological examination of water. *a.* Potable water supply systems and facilities will be operated to provide water of the quality required by TB MED 229.

b. Water samples for bacteriological examination will be collected in accordance with TB MED 229. These samples will be forwarded to the nearest Army Medical Service laboratory or other laboratory designated by the operating agency commander.

8. Water softening. At permanent installations, treatment facilities for softening of the water supply may be installed if the hardness exceeds 200 parts per million (p.p.m.), expressed as equivalent $CaCO_3$ (calcium carbonate), and if investigation indicates that the treatment facilities can be provided economically. Softening of the water supply to a total hardness of less than 100 p.p.m. is not required: however, softening to less than 100 p.p.m. may be justified for special purposes and services such as—

a. Water for laundries. Water for laundries will be softened if the total hardness is 2.5 grains per gallon (43 p.p.m.) or more, expressed as equivalent $CaCO_3$. Installation of water softeners (cation exchangers, sodium cycle) to reduce the hardness to zero is recommended. The equipment for this treatment is covered by standard plans and specifications for laundry construction.

b. Boiler-water treatment. Water for powerplants and heating plants may require softening by means of water softener (cation exchangers, sodium cycle) or other means of treatment depending upon local conditions. See AR 420-49 and TM 5-650.

c. Softeners for mess halls. Water softeners will not be installed for small mess halls (and for latrines and bath houses). The installation of water softeners (cation exchangers, sodium cycle) to reduce hardness to 43 p.p.m. may be justified for large central mess halls to protect equipment and to insure satisfactory washing of dishes. Each proposed water softener installation for a large central mess hall will be justified to the operating agency commander.

d. Softening water for hospitals. When the hardness expressed as equivalent $CaCO_3$ is in excess of 10 grains per gallon, or 171 p.p.m., the required proportion of water will be softened to zero hardness and blended with the required quantity of unsoftened water to produce a resultant hardness of 3 grains per gallon or 51 p.p.m. Where critical equipment requires water having hardness less than 51 p.p.m., a special study will be made to determine the most feasible means of obtaining lower hardness water. Zero hardness water may be piped from the main softener or may be supplied from small individual softeners, whichever is the more feasible.

9. Scale and corrosion control. *a.* Scheduled inspections of water distribution systems will be made to observe, evaluate, and record scale deposits and deterioration caused by corrosion. Water Analysis Work Sheets—For Scale and Corrosion Control (DA Form 5-106) will be prepared from the annual chemical analysis (para. 13). If a study of the chemical analysis indicates that corrective action should be taken, appropriate recommendations for any necessary adjustments in treatment practices required for more effective scale and corrosion control will be furnished to applicable installations. Guidance provided in TM 5-660 will be used for determining the adequacy of scale and corrision control.

b. Application of cathodic protection for prevention of corrosion of external surfaces of buried pipe and submerged surfaces of steel water storage tanks will be determined by technical representatives of the general operating agency commander (AR 37-100).

c. Contracts for scale and corrosion control treatment of potable water will not be made with private, industrial, or commercial firms. Service contracts for the maintenance of cathodic protection systems and for inspection of elevated steel tanks may be authorized by the operating agency commander.

10. Safeguarding terminal water supplies. To prevent pollution of potable water systems at piers and docks at Army installations the following precautions will be exercised:

a. Water connections from the potable water system to any vessel will be placed and operated under the supervision of the individual in charge of the installation water system.

b. Connections from the installation potable water system to vessels with power to operate fire or other pumps will be provided with air breaks or approved blackflow preventers.

c. Hose lines may be carried or used aboard any vessel from the installation potable water system for fire protection, provided no connection is made to the vessel water system, and provided that when not in use the hose lines are so secured as to prevent discharge or submergence.

11. Water-level gages for wells. Drawdown or water-level testing gages will be installed in active deep wells to provide daily operating data essential for further development of underground water supplies and for determining pumping schedules.

12. Meters. *a. Purchase of water.* Purchase from the same vendor will be measured by a master meter. Exceptions are—

(1) Multiple connections for hydraulic reasons.

(2) Multiple connections for use in emergencies.

(3) Connections used only in the event of fire.

b. Sale of water. When the operating agency commander determines that it is feasible and necessary, meters will be furnished, installed, and properly maintained by the purchaser; otherwise the quantity of water sold will be estimated and the purchaser will be billed accordingly.

c. Operational control.

(1) Water meters will be installed for operational control at—

  (*a*) Each water supply well.

  (*b*) Each source of surface water supply where chemical treatment is required.

  (*c*) Each connection delivering water to any other installation or Government agency, except as provided in *b* above.

(2) Electrical meters should be installed for operational control at water and sewage pumping and treatment plants. The meters may be a watt-hour or other type of recording device (such as a timing element) to measure electrical energy used or to record the number of hours of pump operation.

13. Chemical analyses of water supplies. To provide uniform standards of water supply operation and a basis for improving methods of water treatment, a complete chemical analysis will be made of the source of water supply and of water after treatment by filtration or softening.

a. In determining the frequency of submission of samples for untreated water from water supply wells, consideration should be given to the fact that wells producing water from the same underground water-bearing formation are producing water from the same source. Therefore, a sample taken from any one well is a sample of the source of water supply. On this basis—

(1) Inactive wells should be sampled only when scheduled for activation; thereafter, only one sample should be taken annually from each source.

(2) Installations having two active wells producing water from the same formation should take one sample each year from alternate wells.

(3) Installations having three or more active wells producing water from the same formation should take one sample each year from one well. The wells should be selected for sampling on a rotating basis to take one sample from each well in the entire well field before returning to the well first sampled.

(4) Installations having a number of wells, wherein individual small groups of wells take water from different water-bearing formations, should take samples from wells producing from each formation, as described in (1), (2), and (3) above.

(5) NIKE sites, gun sites, and similar installations should submit not more than a total of one sample for each 3-year period after activation of the installation.

b. For a complete chemical analysis of either produced or purchased treated water, one sample will be taken annually from a point on the distribution system.

c. For complete chemical analysis of water, exclusive of field determinations, samples will be submitted to the appropriate United States Geological Survey laboratory listed below. Schedule of samples and supply of bottles and shipping containers will be arranged by the appropriate operating agency commander with the designated laboratory. Request for bottles will specify the number required.

(1) *Installations in Alaska.*
Water Quality Laboratory
U.S. Geological Survey
Wright Building
P.O. Box Z
Palmer, Alaska, 99645

(2) *Installations in Idaho, Montana, Oregon, Washington, and the Far East (Philippines, Hawaii, etc.)*
Water Quality Laboratory
U.S. Geological Survey
830 N.E. Holladay Basement
P.O. Box 3202
Portland, Oreg., 97208

(3) *Installations in California and Nevada.*
Water Quality Laboratory
U.S. Geological Survey
Room 8042 Federal Building
650 Capitol Avenue
Sacramento, Calif., 95814

(4) *Installations in Colorado and Utah.*
Water Quality Laboratory
U.S. Geological Survey
Room 8209 Federal Building
125 South State Street
Salt Lake City, Utah, 84111

(5) *Installations in Arizona and New Mexico.*
Water Quality Laboratory
U.S. Geological Survey
Geology Building
University of New Mexico
P.O. Box 4217
Albuquerque, N. Mex., 87106

(6) *Installations in Iowa, Kansas, Minnesota, Nebraska, North Dakota, South Dakota, and Wyoming.*
Water Quality Laboratory
U.S. Geological Survey
Cotner Terrace Building
225 North Cotner Boulevard
Lincoln, Nebr., 68505
Mailing address for samples:
P.O. Box 591
Lincoln, Nebr., 68501

(7) *Installations in Oklahoma.*
Water Quality Laboratory
U.S. Geological Survey
2800 South Eastern
P.O. Box 95265
Oklahoma City, Okla., 73109

(8) *Installations in Texas.*
Water Quality Laboratory
U.S. Geological Survey
Federal Building
300 East 8th Avenue
Austin, Tex., 78701

(9) *Installations in Arkansas, Missouri, and Tennessee.*
Water Quality Laboratory
U.S. Geological Survey
Room 2301 Federal Office Building
700 West Capitol Avenue
Little Rock, Ark., 72201

(10) *Installations in Alabama, Louisiana, and Mississippi.*
Water Quality Laboratory
U.S. Geological Survey
Room 201 Prudential Building
6554 Florida Boulevard
Baton Rouge, La., 70806

(11) *Installations in Illinois, Indiana, Kentucky, Michigan, Ohio, West Virginia, and Wisconsin.*
Water Quality Laboratory
U.S. Geological Survey
2822 East Main Street
Columbus, Ohio, 43209

(12) *Installations in Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont.*
Water Quality Laboratory
U.S. Geological Survey
Room 341 Federal Building
P.O. Box 948
Albany, N.Y., 12201

(13) *Installations in Delaware, New Jersey, and Pennsylvania.*
Water Quality Laboratory
U.S. Geological Survey
Room 1302 U.S. Custom House
2d and Chestnut Streets
Philadelphia, Pa., 19106

(14) *Installations in the District of Columbia and Maryland.*
Water Quality Laboratory
U.S. Geological Survey
Room 101 Old Post Office Building
12th and Pennsylvania Avenue, NW
Washington, D.C., 20242

(15) *Installations in North Carolina, South Carolina, Virginia, and all overseas installations except the Far East.*
Water Quality Laboratory
U.S. Geological Survey
Room 443, Federal Building
Raleigh, N.C., 27602

(16) *Installations in Florida and Georgia.*
Water Quality Laboratory
U.S. Geological Survey
Room 244, Federal Building
Ocala, Fla., 32670

[ENGMC]

14. Chlorination of sewage. Continuous chlorination of sewage or sewage treatment plant effluent will not be performed in lieu of operating existing treatment facilities capable of rendering adequate treatment without chlorination. Chlorination under any circumstances except emergencies will require prior approval of the operating agency commander.

15. Swimming pools. *a.* Except as provided in *b* below, the operation of equipment and the maintenance, repair, and alteration of swimming pools are repairs and utilities activities and will conform to standards set forth in TB MED 163. The term "operation" applies to water treatment and sewage facilities such as pumps, filters, chlorinators, latrines, and showers, together with the furnishing of operating supplies such as chlorine and other water treatment chemicals. It does not apply to the control of swimmers, cleaning of the pool, or janitorial services.

b. Utilities services for nonappropriated fund operated pools will be furnished in accordance with AR 210-55; operation of equipment and furnishing of operating supplies will be supported on the same basis as utilities services.

16. Records. *a.* The minimum number, kind, and frequency of water and sewerage operating tests and records required for completion of the Repairs and Utilities Operating Logs, DA Form 5-58 (Water—General), DA Form 5-59 (Water—Supplementary), DA Form 5-60 (Sewage—General), and DA Form 5-61 (Sewage—Supplementary) will be accomplished in accordance with the schedules shown in TM 5-660 and TM 5-665.

b. An operating log similar to the one shown in TM 5-662 (when published) will be maintained for each swimming pool.

c. Records listed in *a* and *b* above will not be furnished U.S. Public Health Service and State agencies (para. 4).

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:
J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:
Active Army: To be distributed in accordance with DA Form 12-9 requirements for Real Estate—D.
NG: None.
USAR: None.

U.S. GOVERNMENT PRINTING OFFICE 1968

December 11, 1968

SUMMARY OF WASTE TREATMENT NEEDS
FEDERAL INSTALLATIONS LOCATED IN
THE CALUMET ENFORCEMENT CONFERENCE AREA

Name & Location	Volume & Type of Wastes	Treatment Provided	Status of Compliance With Conference Summary
Indiana Harbor Light Station U.S.C.G., Lake Co., Indiana (East Breakwater Light)	200 GPC - S	Secondary with chlorination discharge to Lake Michigan	In compliance
DMS Depot, GSA Hammond, Indiana	900 GPD - S 100,000 GPD - I	To ground. Cooling water to Wolf Lake - no treatment	In compliance
NIKE Missile Sites:			
Site CG-47, Wheeler, Ind.	6-8,000 GPD - S	Secondary - to unnamed ditch. Chlorination	In compliance
Site CG-32, Chesterton, Indiana	6-8,000 GPD - S	Secondary:chlorination - Discharge to Dunes Cr., then to Little Calumet R.	In compliance
Site CG-45, Gary, Ind.	3.000 GPD - S	Secondary:chlorination - Discharge to Ditch. Effluent chlorination	In compliance
Site CG-46, Munster, Ind.	6-8,000 GPD - S	Secondary:chlorination - To tributary of Hart Drainage Ditch	In compliance
Naval Reserve Training Ctr. Gary, Indiana	800 GPD - S	To ground	In compliance
T. J. O'Brien L&D, Illinois Cook County	400 GPD -	To ground	In compliance

MR. STEIN: Are there any further questions or comments?

MR. POOLE: Mr. Chairman.

MR. STEIN: Yes.

MR. POOLE: I want to ask Mr. Riley, I don't have reports of previous Conferences here, but I think I recall that Mr. Bacon in his September 1967 report made the statement that the U. S. Coast Guard and the U. S. Naval Armory are both discharging direct to the lake.

My question is that I don't see those on the table and do you know the status?

MR. RILEY: The Coast Guard station and the Naval Reserve Armory in Chicago harbor both discharge to Chicago harbor and into the Chicago River system rather than across the breakwater to the lake. I was just informed that with the Coast Guard station attempts have been made to provide facilities there, but the Coast Guard station in the Chicago harbor is scheduled to be closed this coming Saturday.

MR. KLASSEN: Do I understand from what you previously said that the Coast Guard station there does not have treatment?

MR. RILEY: They have primary treatment.

MR. KLASSEN: Chlorination?

MR. RILEY: I don't recall right now. I don't believe so.

MR. KLASSEN: But it is going to be closed Saturday. When is it going to open, Sunday? (Laughter.)

MR. RILEY: I am told it is being phased out, activity being transferred elsewhere.

MR. POOLE: You don't mean the Chicago River system, do you?

MR. RILEY: Yes.

MR. POOLE: I am thinking of the one down on the south side. The Chicago River is way up on the north side.

MR. RILEY: O. K., we are talking about two different locations. The Coast Guard station down at Calumet Harbor is tied into the Metropolitan Sanitary District sewer system.

MR. POOLE: I see.

MR. STEIN: I think in looking at this situation we can come to--at least I come to these--I don't like to say conclusions. I am trying to summarize the facts as you have given them.

All these stations that we have are not very big and they are not really major sources. All of the stations have equipment which puts them in compliance. We really have no assurance that these are being operated at optimum capacity 365 days a year, is that--

MR. RILEY: Well, optimum efficiency.

MR. STEIN: Optimum efficiency, rather.

MR. RILEY: Right.

MR. STEIN: Three hundred sixty-five days a year. So I would say that unlike the cities, and again I want to make it clear that the kind of waste load you get from a NIKE site with a handful of people is nothing--

MR. RILEY: Six to eight thousand gallons a day.

MR. STEIN: --like you would get from a city or a fair-sized industry. I want to make it clear that these are small sites, but we have to show something.

I do think that you and the representatives of the installations should try to come up with some kind of methodology where we are going to have a report here where we can indicate that the Federal installations are in compliance both in equipment and in operation, and that this can be certified to and that the Conferees can agree to that. Because the way this looks now, the cities may be ahead of us on the Federal installations here and I don't think we should lag behind. We are supposed to show the way.

All right. Are there any other comments or questions?

Thank you very much.

MR. KLASSEN: Mr. Chairman, I know you didn't mean to leave this impression that just because it is a small source of pollution it is relatively insignificant. I only know this from reading in the paper, but recently an industry discharged between two and six and possibly nine gallons of oil into the lake and they were taken before the State Supreme Court.

Now, are we trying to rationalize small amounts of pollution and large?

MR. STEIN: No.

MR. KLASSEN: I don't believe you meant to leave that impression.

MR. STEIN: No, no. As a matter of fact, and I think you people have known me 30 years, we have to take every discharge no matter how large and no matter how small and get this corrected. Whether you take anyone to court or not depends on the case.

I remember back in the early 1950's Mr. Poole and I were out on the Missouri River and we really had this problem come up in a very hard way, because we were dealing with some of the largest packing houses, some pretty large cities and some small places that had one or two water closets, some had twenty employees, some had four employees, and I remember we had a big discussion on where we should draw the line.

After going through this with the five or six States involved there and the Conferees and the hearing board which we had then for people from all over the country, we came to the conclusion that you just couldn't draw the line. If you are going to clean up pollution you had to get at every source no matter how large or no matter how small.

What I wanted to do was to put this in perspective on the problem. Sometimes it is easier to get at; it may be more costly to treat; but it is easier from a philosophic and emotional point to get at the big ones than the small ones.

I think, and this is in all fairness to these operations, where you have a NIKE site and where you are cutting the personnel, you are going to have to have a heck of a time running the waste treatment facility.

Now, this goes with every installation, and I have been to my share of Federal installations, and I think this is what you have to recognize. If you have a man in charge of an Air Force base or one of these operations, the first thing he will tell you, he is not in the waste treatment business; he is in the business of the defense of our country. And you wouldn't want another kind of man there. If you had him, you wouldn't be satisfied with the results we were getting at the base.

Given what happens, and necessarily must happen, with the mobility of the Armed Forces we have possibly a little different situation than we have in either our cities or our industries. Sometimes very precipitously either the staff is depleted or increased, and in both cases you are jammed up with the waste treatment. If it all gets increased, you have to put your system working, if you have the capacity to handle it. If you get a sharp decrease, the notion that the head of the installation when he is short-handed is going to put people on waste treatment rather than on military duties is not too realistic.

I think with the notion of these depleted NIKE bases as we have heard of we are going to have to be much more careful in trying to get that and trying to solve the question, but I think we have to take care of the small installations as well as the large ones.

Let us see if we can go on to the industry. I have the list here. Some are marked M.S.D. I hope if my prompter has given me a wrong one that you won't be too severe.

PROGRESS REPORT ON INDUSTRIES IN ILLINOIS

CLARENCE W. KLASSEN, CONFEREE AND TECHNICAL SECRETARY, ILLINOIS SANITARY WATER BOARD, SPRINGFIELD, ILLINOIS

MR. STEIN: Alco Products.

MR. KLASSEN: I will go down the list, Mr. Chairman, and read the industries that are under the Sanitary Water Board jurisdictional area.

The first is Alco Products on Thorn Creek. All of the sanitary wastes go to the Bloom Township Sanitary District. They have an oil separator that functions the way oil separators should. It is an operational problem.

I might say at this point, one of our recent concerns is a decision of the Illinois Supreme Court in connection with a case that enjoined an industry from discharging any oil, zero oil, and this puts quite an operational problem if all of the industries are to comply with this.

But Alco has facilities and it is a question of good operation.

MR. STEIN: Would you say they are in compliance?

MR. KLASSEN: Yes.

MR. STEIN: Do they have operational problems or not, Mr. Klassen?

MR. KLASSEN: They have operational problems in any oil separator, but nothing unusual.

MR. STEIN: Let me again for the record make this clear. As far as the Federal people are concerned on the Great Lakes, our requirement is no visible oil.

MR. KLASSEN: That is correct.

MR. STEIN: All right.

Would you continue? American Agricultural Chemical.

MR. KLASSEN: American Agricultural Chemical, within the next three months all of their wastes, and much of it now, will go to the Bloom Township Sanitary District. They are not technically in compliance, will not be by December 31, 1968, by about two or three months, but I might say that several of these industries in the Chicago Heights area are gearing their program, and it is a question of equipment, to the completion of the expanded facilities at the Bloom Township Sanitary District to which all of their wastes will go. At the present time all the sanitary wastes go to the Bloom Township Sanitary District.

Certain-Teed Products no longer discharge any waste. They have a closed system and all of their wastes go to the Bloom Township Sanitary District. They are in complete compliance.

Commonwealth-Edison Company is in the State of Indiana.

Ford Motor, while it is in the Chicago Sanitary District, does discharge its wastes to the Bloom Township Sanitary District.

International Mine and Minerals on order of the Sanitary Water Board is in compliance and now discharges all of their wastes, sanitary and industrial, to the Bloom Township Sanitary District plant.

Midwest Forging Manufacturing Company, they again have an oil separator problem. I say it is a problem, an operational problem. But they are in compliance.

The State Street Ditch, which is a ditch that runs through the--

MR. STEIN: Pardon me, how about Spencer Chemical?

MR. KLASSEN: Spencer Chemical is in the Chicago Sanitary District.

MR. STEIN: All right.

MR. KLASSEN: State Street Ditch is a stream that runs through Chicago Heights and there are still two industries that at the present time are discharging small amounts of wastes. They are converting rapidly as possible to discharging all of their industrial wastes to the Bloom Township Sanitary District. All of the sanitary wastes go to the District plant.

I could detail Stauffer Chemical, and

this is the major one, what they have done. They are down now to ferreting out some of the floor drains and whether they go to the ditch or to the sewer. But they will by July be in complete compliance.

MR. STEIN: That is July 1969?

MR. KLASSEN: 1969. Part of it is a question of equipment, but they are on schedule as far as we are concerned.

MR. POSTON: In addition to Stauffer Chemical Company, what other industry?

MR. KLASSEN: The only other one on the ditch now is Calumet Steel, and there is also a question operational problem. All of their sanitary wastes go to the Bloom Township Sanitary District and they, too, will discharge all of their waste to the expanded Bloom Towmship Sanitary District which will be in operation in July 1969.

MR. STEIN: Are there any comments?

I might say in summary, I think as far as the industries under the jurisdiction of the State of Illinois, the industries are in substantial compliance. In the two cases where they are not they are under way, one will be completed in three months and the other in

July in 1969.

MR. KLASSEN: That is correct.

MR. STEIN: Is that correct?

MR. KLASSEN: That is correct.

MR. STEIN: All right.

Let us see if we can go to the industries under the Illinois District.

Allied Chemical Company.

MR. EGAN: Is that under the Metropolitan Sanitary District?

MR. STEIN: Yes, M.S.D.

MR. EGAN: Mr. Bacon, will you step forward and make the report on these industries?

PROGRESS REPORT ON INDUSTRIES IN THE METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, VINTON W. BACON, GENERAL SUPERINTENDENT, MSD, CHICAGO, ILLINOIS

MR. BACON: Mr. Chairman, Conferees, ladies and gentlemen.

This is the official statement of the Metropolitan Sanitary District.

Let us state at the outset emphatically

and firmly that the Metropolitan Sanitary District of Greater Chicago, which we have the honor to represent at this Conference, has vigorously and assiduously fought for the purification of the waters under the District's jurisdiction and has battled water pollution on all fronts. It will continue to do so in the future, ever mindful of its historical origin which prompted the establishment of the District for the purpose of preventing the pollution of Lake Michigan and as a necessary incident thereto of all the waters within the District's jurisdiction. The District will continue to forcefully fight water pollution because of its declared policy of the Federal Government that it is the primary responsibility of the State and, hence, the public agencies to whom the State has entrusted such powers to combat and wipe out water pollution.

Now getting down to specifics.

Based on an extensive bar graph report and other information submitted to the Metropolitan Sanitary District by the U. S. Steel Company, we have every reason to believe that the Company will be in compliance with the standards established by the Federal Conference as to Lake Michigan by December 31, 1968, the deadline set by the Conference.

MR. STEIN: Mr. Bacon, I wonder, when we started this we had a list that I think the Conferees felt they could go down. Would it be agreeable if you could go down that list in that order?

MR. BACON: Let me finish this, please, first and I think I will cover your list adequately, if you will let me, please. I can take the list separately later on.

MR. STEIN: All right.

MR. BACON: Moreover, the U. S. Steel Company has submitted to the District a schedule for additional projects to be undertaken by it which go beyond the Federal Conference standards and are expected to bring the Company in compliance with the water quality criteria and standards of the State Sanitary Water Board and the Metropolitan Sanitary District of Greater Chicago, namely SWB-15 and corollary regulations.

In view of the State's and Mr. Klassen's opinion and his statement, the District must take the same position to the effect that at the present time the various industries situated at the Calumet River are not subject to the Federal Conference standards or the deadline of December 31, 1968. However, all industries located there, with the exception of two, have submitted schedules to the District which should bring them in compliance with the standards fixed by SWB-15 by September 30, 1969, the deadline established in that regulation. These two companies are Republic Steel and U. S. Steel.

As far as the aforesaid two industries are concerned, they have at the present time submitted plans to the District for review and as soon as that review is completed and the District has determined that the plans are meaningful and contain a realistic time schedule, the plans will be presented to the State Sanitary Water Board for its approval.

So, therefore, Mr. Chairman, and members of the Conference, all other industries except those two on your list will be in compliance by September 30, 1969.

MR. STEIN: December 30, 1969, or 1968?

MR. BACON: September 30, 1969, in accordance with SWB-15. The question of jurisdiction here is not ours,but would be the--

MR. STEIN: Wait, just a minute.

Pardon me, go ahead.

MR. EGAN: You go ahead.

MR. STEIN: In other words, these other lists will not be completed by December 30, 1968?

MR. BACON: I cannot tell you in detail, Mr. Chairman, which might and which might not by that date. We are simply submitting in accordance with the interpretation that these come under the September 30, 1969, jurisdiction.

MR. STEIN: Mr. Bacon, what we would like, if we could, was at some time a rundown industry-by-industry with your analysis and prognosis of the date of completion on each one.

MR. BACON: I can only tell you now, Mr. Chairman, that they will meet the deadline set in SWB-15.

MR. STEIN: What is that?

MR. BACON: September 30, 1969.

MR. STEIN: In other words, you are telling us that you cannot assure that a single industry on this list will meet the December 1968 deadline?

MR. BACON: No, sir, I did not say that. I said they will meet the deadline of SWB-15. I think, Mr. Chairman, the question of jurisdiction here is not mine, it is yours, and I am telling you that we are going to meet--they will meet, with the exception of the two that I listed--

MR. STEIN: We are not asking you about jurisdiction, Mr. Bacon. We have gone down the list, and let me try this again, I would like to go down starting with Allied Chemical, Bulk Terminal Company, Cargill Company, and ask you what date they are going to be completed on each one and the specifics on each one, not a generalized statement.

MR. BACON: On all of the list that you furnished I cannot tell you what date between now and September 30, 1969. I can only tell you they will meet that regulation.

MR. STEIN: The requirement of this Conference is they be completed in 1968. Now, if we are going to make any judgment, and I think we have gotten this from the other Conferees again and again in this, if we are going to make any judgment we have to have a list-by-list source-by-source announcement of when we can except completion, and this notion of summarizing them over and over again does not permit anyone to make a definitive judgment on which is moving and which one is not.

And I take it that as we go down this

list we are not going to get an individual response on the Allied Chemical, Bulk Terminal, Cargill, Inc., Catalin, Chicago Brick, Ford Motor, General Mills, Gulf Oil, Interlake Steel Blast Furnace, Interlake Steel Coke Furnace, Interlake Acme Steel Riverdale Plant, the Republic Steel, the Swift and Company, United Chemical Company, U. S. Steel Chicago Works Phase I, U. S. Steel Chicago Works Phase II, and the Wisconsin Steel?

Now, this is the list we have and I take it we are not getting specific information on any of those.

MR. BACON: You are getting very specific information on all except two, Republic and U. S. All of them will be in compliance by September 30, 1969, the date that SWB-15 is applicable.

And I will remind you, Mr. Chairman, and I think you had better call upon our State Conferee, Clarence Klassen, for elaboration upon this, there were no water quality criteria set under the Federal Conference for the Calumet River.

MR. STEIN: How many of these will be in compliance by December 1968, of this list of industries

I read?

MR. BACON: In compliance with what, sir?

MR. STEIN: With your requirements.

MR. BACON: The requirements, sir, were not set by the Federal Conference either at the time of the original Conference or subsequently thereto, and I will remind you that no water quality criteria were set on the Calumet River by the special technical committee that was appointed to make recommendations to you. And I think the position of the State of Illinois is until SWB-15 came about there were no criteria to be met and there was no deadline. So if you don't have criteria, you certainly cannot have something that they are supposed to meet.

And I think that you should call upon the State of Illinois, because I believe that you are presenting something here publicly that might misrepresent the situation that these industries are meeting a schedule duly set by law and duly approved--duly set by the State and duly approved by the Department of the Interior. Now, if we had another set of criteria as a result of the Federal Conference itself they would apply, but the first criteria that were set were set by the State of

Illinois on June 30, I believe it was, and subsequently amended by June 30, 1967.

MR. POOLE: Mr. Chairman, I just want to get into the record that the same situation applies as far as the Indiana Harbor ship canal and the Grand Calumet River is concerned. My recollection of the studies of the technical committee was that they made no attempt to develop criteria for those streams in Indiana or for the Calumet River, but I thought we had been proceeding under the philosophy throughout this entire Conference that any contributor of pollution within the Conference area, and it was my understanding it did go down to the O'Brien Lock as far as the Calumet River is concerned, that these industries and municipalities were obligated to do certain things.

MR. STEIN: Well, that was my understanding. I have two problems with this. One problem is that while we didn't set criteria for certain of these waters in Indiana and in Illinois as has been mentioned, the notion was that the industrial waste treatment was to be completed by the end of 1968. I have no indication that this has happened.

The other problem we have, and this has

been one for the past several years, Mr. President, and I say this to you as Conferee of the District, we just have not been able to get to the Conferees, and I don't know that you have, the kind of individual detailed information, plant by plant, for the plants within the jurisdiction of the Sanitary District that we have had from Illinois and Indiana. I think the record speaks for itself here. I just can't change this.

MR. EGAN: Can't we get them that information, Mr. Bacon?

MR. BACON: We have, Mr. President and Conferees. The one discharge, and I think the thing that has been overlooked here, when the Conference started O'Brien Lock was not operative and the industrial flows did reverse and go into the lake during time of runoff. Since the O'Brien Lock became operative, and it became operative on July 1, approximately, of 1965, it came about because of this Conference, which then thereafter prevented the flow of any of these wastes into Lake Michigan.

We have only one industry drawing water out of Lake Michigan and returning wastes into it at the present time and that is U. S. Steel. And I have made the statement here that U. S. Steel will meet the December 31, 1968, requirements of this Conference.

We have no other industrial discharges to Lake Michigan and out of this Conference there were no water quality standards set to control the industries along the Calumet. They came from the State Sanitary Water Board under the 1967 water quality standards program.

There were no standards then from the Federal Conference and there are none now except as they have been endorsed by the Department of the Interior as those that were adopted by the State Sanitary Water Board.

I think you should check this point, Mr. Chairman, with the State.

MR. STEIN: There is no misunderstanding. There may be a problem here on jurisdiction where people may differ on the jurisdictional question, but in all our dealings with both States and with the District, whatever has been the question on jurisdiction, we have had a full disclosure point by point of what is going on.

Now, repeatedly when we go down the list of individual sources of what is required, what is being done, when it has to be done, if we get answers in terms of standards or we get answers in terms of lack of jurisdiction, we don't have this information. I know of no one who has this information publicly. Certainly we all have the Illinois information, we have the Indiana information. This is the kind of information we have not been able to get here.

Now, what this has to do with the question of jurisdiction, I have trouble in understanding. Because as far as I know, in dealing with the District you are dealing with public business in a public manner and you are a public agency, and I just can't quite get this position.

MR. EGAN: You mean get our position?

MR. STEIN: Yes, of why this--

MR. EGAN: Is there any reason why he can't have that information, Mr. Bacon?

MR. BACON: They have been furnished everything that they wanted. We have made detailed reports to the Federal Government and the State Government. I want to point out that--

MR. EGAN: Now, wait a minute, let's stop there. If we have given them the information he wants, what is he asking for now?

MR. BACON: We have given them the information they wanted on U. S. Steel. We have had repeated correspondence, the one discharge that is affected here.

And I would like to point out to the Conferees and the audience that very recently Mr. Klassen wrote a letter stating the position of that Conferee and the State of Illinois and the State Sanitary Water Board and brought up this very question as to what discharges come under the jurisdiction of this Conference, and a copy of that letter was furnished to other Conferees. I believe I am correct.

Am I not, Mr. Klassen?

MR. KLASSEN: Yes.

MR. BACON: Now, this is nothing new, I tell you Conferees. It was something that Mr. Klassen and the Sanitary District have repeatedly requested that this particular Conference decide.

Mr. Klassen very clearly pointed out in his letter--I do not remember the date, but it is not a recent one, that is of the last week; it is probably upwards of two or three weeks or a month old. Now, that was not taking anybody by surprise. Mr. Klassen laid it right on the line and he said this is the position of the State. He points out that there were no standards and, therefore, the industry under the jurisdiction of this particular Conference is one.

If it is not, that is for the Conference to decide, not for me to have to stand up here and defend.

MR. POOLE: Mr. Chairman.

MR. STEIN: Yes.

MR. POOLE: I received a copy of Mr. Klassen's letter and I wrote a similar letter taking an opposite view and I believe that FWPCA has since then in response to both letters also taken the view that these industries that I mentioned within the O'Brien Lock were still within the jurisdiction of the Conferees. Am I incorrect in that?

MR. STEIN: No, you are correct.

Now, here is the question. I don't know whether Mr. Klassen retains his view or not. But Mr. Klassen has raised a question and written a letter on jurisdiction of the Conference. Mr. Poole had another view on that matter. We have not heard from the District. The Commissioner of Water Pollution Control, Joe Moore, had another view that this was included.

However, we are not, I hope, at this point, and this is not the stage, we are not at this jurisdictional question now. Whatever the jurisdiction, and you can decide it one way, either we have it, the jurisdiction, or we do not have the jurisdiction, but the question here, and this is for the people of Chicago, in cleaning up the lower end of Lake Michigan it seemed to all of us that regardless of jurisdiction and cleaning up this area that you were entitled to a detailed report on every industry and municipal entity in the area.

Now, I don't want to go down this list necessarily again for emphasis because this has nothing to do one way or the other with the industry not being cooperative or they are not doing the job or anything. I don't want this to be interpreted that way. But we do have this kind of detailed information on the other dozen or so industries that I have read before, and we can make this list available. The question that I still have is why in the world, no matter what the judgment is on the jurisdiction, shouldn't that information be available plant by plant and what has the question of jurisdiction got to do with that? That may be another question for the Conferees to decide.

My technical staff in communicating with them yesterday told me that they have not been able to get a report on these industries that we have listed for about two or three years. And I wonder why, Mr. President, can't we get this? Why can't the public have it?

MR. BACON: Mr. Chairman and members of the Conference, may I answer your question about December 31?

Assuming now lack of jurisdiction or jurisdiction one way or another, all of these industries are in compliance with the Federal Conference standards as measured at your point of control, the water intake, at the present time, with one exception, that is U. S. Steel, which will be in compliance, for the simple reason they don't flow to the lake.

MR. KLASSEN: Mr. Chairman, I think inasmuch as I have been brought into this I want to explain why I raised this point in the letter of November 13th.

In preparation for this Conference there was an area of water quality standards missing in this area under this Conference consideration, and I did not want to leave any gray or fuzzy areas here that someone will say we don't have jurisdiction or we do because we have been through this before. And I raised this point for this reason, as has been explained by Mr. Bacon.

This Conference did not set any water quality standards on the Calumet River from the O'Brien Locks to the mouth, and obviously without those standards how would an industry know what they are supposed to do or when they are supposed to do it, and because of this omission, whatever reason for the omission you could attach to it, the State of Illinois, under the jurisdiction given to the Sanitary Water Board by our Legislature, set water quality standards for the Chicago Sanitary District area and included the Calumet River in this because there existed no standards for that stream. We submitted this document, which has been referred to as SBW-15, to the Department of the Interior and with the standards and the implementation date of September 30, 1969, as Mr. Bacon said. This was approved by the Secretary of the Interior. And inasmuch as these are the only standards with an enforcement date that exist so far as I know of, I raised this point.

MR. POSTON: You do raise the point, you say?

MR. KLASSEN: I did raise the point and I raise it here. The State of Indiana does not agree with this concept and the Federal Government does not agree with this concept. I merely brought it out early so that at the last minute here there would be no area that could be said, well, what are the standards.

MR. POSTON: It is my understanding, Mr. Klassen, that SWB-15, the water quality standards as approved by Secretary Udall, called for a December 1968 date and that this is the standard that was approved by the Secretary and this is the standard that I would look for Illinois unless there has been a change to September 1969--

MR. KLASSEN: There has been a change--

MR. POSTON: --which I know--

MR. KLASSEN: --and let me tell you why that change was made. We were one of the first States to hold hearings and submit our standards. They had to be approved by June 30, 1967. They were submitted on date. And the delay in getting these approved, not only Illinois but the other States, involved several months' delay, and, therefore, the date was changed from December 31, 1968, to September 30, 1969, because of the delay in the Federal Government reviewing and approving these. We submitted them on time. I want to bring out this point. And that is the reason for the change of date.

MR. EGAN: Who changed the date, Mr. Klassen?

MR. KLASSEN: We submitted the date change to the Federal Government and Secretary Udall approved it.

MR. POSTON: But the Secretary did not approve the changed date, to the best of my knowledge.

MR. STEIN: Wait a minute. I think what we are doing here is we are probably dealing with a factual issue, and I don't want to cut this off, but I think we probably can arrive at an agreement if you get together. I want to put both things to the Conferees before lunch; you might get together on these dates, whether it has been changed or not, if you want to put that in the record. But before we recess, this whole question does not seem to me at all relevant to a status meeting where we are here to see what everyone does when we ask point by point, whatever you are going to do, what that industry has to do and when they are going to do it.

President Egan, let me tell you, as far as we have been able to determine in our dealing with pollution control problems, once the program is set it is my firm conviction and I think the conviction of every State in the Nation--and I have dealt with all of them on these Conferences--that the way to get a compliance operation is go down on a status report industry by industry, city by city, saying exactly what you expect them to do, when you are going to do it, so you can judge whether they are making progress, so other governmental agencies, State, Federal or local, can make a judgment, so their neighbors can make a judgment, so the press and the public can make a judgment.

The question of jurisdiction is another question we can come to. Even if it were a 1969 date, what are the interim dates or what are these people supposed to do? Now, this is what water pollution control, I think, as it has developed in the past 25 years is all about.

If we have this refusal from the Sanitary District to give us this information, and the States, not just the Federal Government, but the States of Illinois and Indiana, this kind of information, this will be the first time that I know that an official agency has not given us these details, and this counts to 50 States, Puerto Rico, Guam and all our other territories and commonwealths. This is the first time we will not be able to get it. And in my judgment, I think it is going to be a very, very difficult thing for the Conferees to be able to make a determination on compliance or equities of extending something if the record is not out in the open from the very beginning so we can make a judgment whether there is a bona fide effort.

Now, I would ask that this be considered during the luncheon recess and maybe the position of the District can be reconsidered on this.

MR. KLASSEN: Mr. Chairman, I want to say so far as the point I raised is concerned, it is not related to your request at all.

MR. STEIN: Right. That is correct. And let me say this without prejudging this on jurisdiction, I think that point is very well taken and very well may have to be met by the Conferees.

But really, sir, it has nothing to do with this, and every time we ask for these if we are met by a question of jurisdiction on standards I am not sure we don't consider we are met by an irrelevancy and an unresponsive answer.

MR. BACON: Mr. Chairman.

MR. STEIN: Yes.

MR. BACON: On behalf of the Sanitary District, I would like to read into the record the compliance by the industries along the Calumet River. The compliance is measured by the control station, I believe it is at the Hammond intake, and we have told you the one company that discharges directly to the lake, U. S. Steel, will be in compliance, as far as we can measure it and they, by December 31, 1968. I am going to read each one of these now that is along the Calumet River that is not discharging to the lake and, therefore, is meeting by December 31, 1968, the Federal Conference, waiving any question.

Allied Chemical Company. Under our jurisdiction they are O. K.

Bulk Terminal Company, O. K.

Catalin Company. They were in compliance. We have had a little problem of a break in their system. They will be in compliance.

Cargill likewise is in compliance.

Chicago Brick is in compliance.

Commonwealth-Edison Company is in compliance.

Ford Motor Company is in compliance.

General Mills, O. K.

Gulf Oil, O. K.

Interlake Steel, O. K.

Republic Steel, as far as the lake is concerned, O. K.

Spencer Chemical, O. K.

Swift and Company, O. K.

United Chemical Corporation, O. K.

And Wisconsin Steel, O. K.

They are meeting the December 31, 1968, requirements at the measuring point.

Now may I finish and tell you about the cities that you inquired of?

Regarding Hazel Crest, chlorination is

on line. The plant is a secondary plant and the plant meets the standards of SWB-15.

Regarding Matteson, their plant will be taken out of existence as soon as the present sewer construction is completed. In the meantime it is being operated, as in the past, as a secondary plant but with additional chlorination.

And that finishes our report except if you have some questions.

MR. STEIN: Well, again, Mr. Chairman, when you say these are O. K., you are again judging them against what you consider to be the proper jurisdictional requirements of the Conference--

MR. BACON: No, sir, by the control point at the Hammond intake, which was the measuring point.

MR. STEIN: Are you saying that for every industry you indicated O. K. that between now and 1969 you are not going to ask for any more remedial action? All they have to do is to continue operations? They don't have to put in any more equipment?

MR. BACON: Quite the contrary. I thought I made it clear that SWB-15 requires--

MR. STEIN: I think you made it clear to

me. I hope it is clear to everyone.

MR. BACON: Wait a minute, let me finish, please, sir.

SWB-15 requires much more than they have to do just to discharge into the Calumet River at the present time under the State standards, and they will meet these, except for the two that I named, as far as we can determine, by September 30, 1969. And the other two companies, I will name them so we be sure that we have no misunderstanding, Republic Steel and U. S. Steel, have been working with us almost daily setting forth a schedule of purchases of contracts, of work, so that they will be in compliance not very long thereafter. But if they go beyond the September 30, 1969, date they will have to have our approval and that of the State Sanitary Water Board.

I am trying to stand up here and tell you these people have extensive programs of correction. And I would like to add on behalf of the Sanitary District without any details, I think anyone that is reading the newspapers in this area and seeing what is going on in litigation knows that we are pulling no punches.

MR. STEIN: Again, Mr. Chairman, let me

repeat my question. The question is, we recognize that you have to have a program involving many details in interim dates and dates to do this. I wonder if we can have a breakdown industry by industry of those details in a similar manner to which we have received the Lake Michigan Conference from the four lake States, which we have received at the Calumet Conference and lower Michigan Conference from the two States here, and which we traditionally receive from every State in this country?

MR. EGAN: I see no reason why you can't have it.

MR. BACON: And I don't think there has been any dereliction or overlooking at all.

MR. STEIN: I haven't seen it yet.

MR. BACON: We have made very detailed reports to the Federal Government, the Department of the Interior and the State Sanitary Board, and I cannot let the record go without stating that that is not the case. I would certainly be willing to have the record examined.

MR. STEIN: Are there any further comments?

Let's recess for lunch until 1:30.

(Whereupon, a luncheon recess was taken.)

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AFTERNOON SESSION

(1:30 p.m.)

MR. STEIN: Let's reconvene.

We are going to call on Indiana for its industries.

One, Adolph Plating.

MR. MILLER: Mr. Chairman--

MR. STEIN: I am sorry I had to start off with that one, but that is at the top of the list.

MR. POOLE: We are sorry too.

PROGRESS REPORT ON INDUSTRIES IN INDIANA

PERRY E. MILLER, ASSISTANT DIRECTOR, DIVISION OF SANITARY ENGINEERING, INDIANA STATE BOARD OF HEALTH, INDIANAPOLIS, INDIANA

MR. MILLER: Mr. Chairman, I might say with the exception of Adolph Plating and Steiner Tissue Mills of Georgia Pacific, I believe all the industry in Indiana did meet the time schedule as far as submission of plans, preliminary plans and final plans are concerned and I won't detail that when I discuss these individual industries.

Adolph Plating. On December 19, 1967, the

Board issued a pollution abatement order to the industry. The order authorized that adequate waste treatment facilities must be provided by December 31, 1968.

The industry employed an engineer and began work on plans and specifications for waste treatment facilities. Representatives of the Board met with representatives of the industry in July and September to discuss revisions to the plan.

In a letter dated November 1, 1968, the industry advised that in view of the expense of installing waste treatment facilities they were negotiating with the East Chicago Sanitary District concerning connection to the District's sewage system.

On November 18, 1968, the Board referred the case to the Attorney General for enforcement of the Board's order.

The Board will continue efforts to obtain compliance with the order at the earliest possible date.

At the present time, and until enforcement of the order, this industry is not in conformance.

MR. STEIN: They are not in conformance? Do you have the case docketed or anything?

MR. MILLER: No, the case is not docketed.

It has been referred to the Attorney General, and he has not filed as yet.

MR. STEIN: All right.

Well, we recognize that Adolph Plating is one of these cases where they are not in compliance, can we say that?

MR. POOLE: That is correct.

MR. MILLER: That is correct.

MR. STEIN: Again let me make this clear, and I don't know if anyone from Adolph Plating is here, either they are going to come in compliance and I hope with State legal procedures or else the Federal Government will not hesitate to exercise its authority.

American Maize-Products.

MR. MILLER: American Maize-Products Company, Hammond. The Company discharges its sanitary wastes to the Hammond Sanitary District as well as some of its strong industrial wastes. The Company completed installation of a double-effect evaporator in the syrup refinery that has prevented loss of product to the sewer. In-plant housekeeping practices continue to be improved.

Construction has been completed on the conversion of the lagoon system to a totally aerobic system. Six 50-horsepower mechanical aerators have been installed in cell number 1 and 95-horsepower existing aerators are being maintained in cell number 2. Cells numbers 3 and 4 are not being operated. The effluent from the lagoon system is being discharged to the Hammond Sanitary District sewerage system.

Construction has started on a clarification tank which will enable the Company to convert the operation to an activated sludge operation with aerobic digestion of sludges and final stabilization of the waste in a terminal pond prior to discharge to Lake Michigan. Construction of this facility is scheduled for the first quarter of 1969. In the interim period, the wastewater from the aerated lagoon will continue to be discharged to the Hammond Sanitary District sewerage system.

The Company is providing adequate waste control and is in compliance with the Conference.

MR. STEIN: And you think all their work will be completed by when in 1969?

MR. MILLER: This work, which they will then discharge the effluent to Lake Michigan, will be the first quarter of 1969, but currently this is not going to Lake Michigan, it is going to the Hammond Sanitary District.

MR. STEIN: Now, unless any of you people are in doubt what we mean about details, and I don't want to pick this because we just did the first one at random, I think a report such as we got in the American Maize is precisely what we mean.

How about American Oil?

MR. MILLER: American Oil sanitary wastes are discharged to the Whiting Sewer System, which are then treated in the Hammond Sanitary District. Industrial wastes are handled by the Company.

During 1968 the Company completed construction of improvements to the cooling water separator and ballast water separation facilities and continued work on in-plant controls to reduce periodic high concentrations of contaminants. The Company has completed all projects proposed for completion by December 31, 1968.

At previous meetings of the Conferees, the Board has outlined that additional removal of BOD and threshold odor-producing substances was needed at American Oil Company. In order to achieve this, the

Company is proceeding with plans for advanced waste treatment facilities. The preliminary plans were approved by the Board on August 20, 1968. The new additions will consist of an air flotation facility to further treat the effluent from bioflotation facility and an incinerator for handling sludges and waste oil products. The facility is expected to provide 80 percent reduction in threshold odor-producing substances and additional removal of BOD, suspended solids, phenol, and oil.

The time schedule approved by the Board for completion of construction of these facilities is December 31, 1970.

We can say that by having the bioflotation facility installed that this was done and the ammonia stripper was completed before December 31,1968, and fulfilled the commitment that Americal Oil had with the Board and is in compliance with the requirements of the Conferees.

MR. STEIN: I want to make this clear while we are doing this, and I read about the American Oil.

American Oil is in compliance with our

1965 requirements. American Oil, though, under the leadership of Russ Mallatt--and I saw him here this morning.

MR. MILLER: He said he had a meeting this afternoon.

MR. STEIN: --is going beyond this with extra treatment which should result in improved water conditions, and I think some of us have been out to see the American Oil plant and it appears, on our inspections, to be operating properly.

I want to take this occasion to commend the Company for their action here, because they are not just stopping with the minimum requirements of the Conferees, but they are going on on their own and putting in additional treatment facilities. This is the kind of approach that we welcome, because if we are talking about the quality of the water in the lake after the treatment and the Company is ahead of the regulatory agencies, I think we have indicated that a good job can be done. And this is the kind of response and cooperation we have received.

Now, again for American Oil, as I will say for any of the companies, when we have dealt with them directly, we have had no problem in getting full disclosure of what they were doing and a full inspection of the facilities. I might want to put one caveat on that. We have no interest in going into secret processes; that doesn't bother us a bit. But as far as the facilities that we are concerned with, we have had an open-door policy, American Oil has followed that, and I think for all the people who are here this is the key point. They have not stopped with the minimum we have asked. They are going ahead and putting in more.

May we go to American Steel Foundries in East Chicago.

MR. MILLER: American Steel Foundries in East Chicago sanitary wastes are discharged to the East Chicago Sanitary District sewerage system and inspections by representatives of the Board and results of effluent analysis show that adequate industrial waste control is being maintained and it complies with the requirements of the Conference.

MR. STEIN: How about American Steel Foundries in Hammond?

MR. MILLER: This one we reported earlier in the Conference was connected to the Hammond Sanitary

District and is in compliance with the requirements of the Conference.

MR. STEIN: There is no discharge from that except through the District?

MR. MILLER: That is right.

MR. STEIN: All right.

Berry Refining.

MR. MILLER: Let me find it.

MR. POOLE: We didn't set our report up in the order of this agenda, Mr. Chairman.

MR. STEIN: I recognize that. You know, our guys are really simple. They set this up in alphabetical order. (Laughter.)

MR. MILLER: Berry Refining Company, we have reported to you and the Conferees in the past, has ceased operation. However, lately we have learned that the refinery property has been sold to the Conservation Chemical Company. The Company is investigating the possibility of establishing an operation for recovering ferrous sulfate and ferrous chloride from waste pickle liquor and treatment of oils and various concentrated chemicals. Adequate waste treatment will be required for the operation if there is an installation of recovery facilities at this plant location.

MR. KLASSEN: Could I ask a question there?

MR. STEIN: Yes.

MR. KLASSEN: Mr. Miller, do you know, is that the same company that now has an operation in Kansas City? If they are, they are a good one.

MR. MILLER: I believe it is, but I am not really sure of this, Mr. Klassen.

MR. KLASSEN: O. K.

MR. MILLER: I believe that is correct.

MR. POSTON: They are not in operation now?

MR. MILLER: No.

MR. POOLE: No, no, they've just acquired the ground.

MR. STEIN: I take it as any new plant, they will require a permit from the State, and I am sure Indiana is going to require them to take care of their wastes before they get the permit.

MR. MILLER: This is correct, and we have had such discussions with them.

MR. STEIN: I don't think there is any question on that.

Blaw Knox Company.

MR. MILLER: Blaw Knox Company, East Chicago, sanitary wastes are discharged to the East Chicago sewerage system. Inspections by our representatives and effluent analysis show that adequate waste control is being maintained and they are in compliance with the requirements of the Conference.

MR. STEIN: Calumet Nitrogen Products.

MR. MILLER: This one went out of business this year. It did discharge its sanitary wastes to the Hammond Sanitary District and it was in compliance before it went out of business, but it is no longer--

MR. STEIN: I hope there is no connection.

MR. MILLER: No longer operating at the present time. No, there is no connection.

MR. STEIN: Cities Service Petroleum.

MR. MILLER: Cities Service Oil Company, East Chicago, sanitary wastes are discharged to the East Chicago Sanitary District sewerage system. The Company has continued to improve in-plant controls. Work will continue on in-plant controls and if studies show that an additional control of threshold-odor substances or other contaminants is needed, the necessary control will be required. It is in compliance with the requirements of the Conference.

MR. STEIN: What is that, an in-plant control system and you are checking the effluent?

MR. MILLER: We are checking the effluent. And I might say, I neglected to say that all the industries in the list as we reported in the past, with the exception of Adolph Plating, are submitting monthly operational reports to us, so we are getting monthly operation reports.

MR. STEIN: What is your prognosis on Cities Service? Do you think they are getting--

MR. MILLER: I would say the waste effluent data indicates that the concentration of the various constituents is very low and it appears that it will meet requirements. However, we have some question, as it is a potential source of threshold-odor material with what may come in the future, and for this reason we have indicated that we want to continue to look at this one in that respect.

MR. STEIN: Yes. Again for the people who aren't familiar with the problems in all these businesses, in the petroleum industry, given the type of plant, very often the best controls can be in-house controls and housekeeping, not let the wastes get out at all, and if you can trap enough of these and keep them there, then you have your problem pretty much licked.

We have had quite spectacular results with that. We had one plant not in this area where they were putting out 14,000 pounds of phenols, and by in-plant controls they got them down to about 1,200, to give you a notion of what can be done with in-plant controls in this type of plant.

How about Commonwealth Edison?

MR. MILLER: Commonwealth Edison Company of Indiana discharges sanitary wastes to the Metropolitan Sanitary District of Greater Chicago. It does provide facilities and inspections by representatives of the Board and effluent analysis shows that adequate waste control is being provided. However, the Company is currently planning improvements to the bottom ash collection and dewatering facilities at the plant. The improvements will probably include filtration of the bottom ash for maximum suspended solids removal. And it is in compliance with the requirements of the

Conference.

MR. STEIN: Do they have a thermal pollution problem there at all?

MR. MILLER: Not that I know of. They do discharge cooling water which has a temperature increase, but I am not aware that there is a thermal problem.

MR. STEIN: E. I. du Pont.

You see, we have all the small companies on this list.

MR. MILLER: E. I. du Pont de Nemours & Company, Inc., East Chicago, sanitary wastes are discharged to the East Chicago Sanitary Sewerage System. The Company has completed improvements to the acid neutralization facilities and the settling facilities for diatomaceous earth used as a filter aid in the Ludox operation. These facilities are in operation and performing satisfactorily. Construction is near completion on a new gas-fired powerplant. Use of East Chicago city water for makeup to the boilers will eliminate water treatment sludges presently encountered from treatment of Grand Calumet River water. Brine from regenerating zeolite water softening facilities for the boilers will be stored and discharged slowly to the receiving stream.

This construction will be completed by the end of 1968.

A fire during 1968 caused extensive damage to the Company's chlorides manufacturing building and the manufacturing operation has been discontinued. To date, the Company's plans are not to restart the operation. Approximately 6,000 pounds per day of chlorides and 500 pounds per day of zinc have been eliminated with discontinuance of this operation.

Inspections by representatives of the Board and effluent analyses show that the Company is providing adequate waste control. The Company will be required to maintain the effluent monitoring program and provide satisfactory operation of all waste treatment facilities and the Company is in compliance with the requirements of the Conference.

MR. STEIN: How about the--I don't know what this is doing on the list, but here it is--East Chicago Storm Sewer. How did this get in?

MR. MILLER: I asked this question too, Mr. Chairman. But in the original report there is a storm sewer that comes into the Lake George Branch of the Indiana Harbor canal that does carry oil and has been shown in the past by analysis to contain constituents common to industrial wastes. We know of no connections of industrial wastes in this sewer system.

American Oil Company in Whiting and Sinclair Oil Company in East Chicago are currently conducting a well point operation to dewater the area and see whether they can detect where these constituents are getting into the sewer and they appear to be coming from ground water in the area rather than from direct discharges. If they can be located, why, corrections will be made.

MR. STEIN: In other words, this is still a detective problem and you can't pin the source down yet?

MR. MILLER: This is right. And the sewer goes up along Indianapolis Boulevard and it is a question, with no direct connections, to our knowledge, of ascertaining the sources of these constituents.

MR. STEIN: Right.

This from time to time, as some of you people might know, becomes a vexing problem. We find some constituent wastes in a sewer or in a stream and before we can correct it we have to know where it comes from. This is just one of the facts of life. I am aware that these are not very easy to detect sometimes.

To give you a notion of one of the problems we had here, we had a problem in Washington, D.C., of people having a gasoline odor in their water, and we began checking this and checking this and we just couldn't find how possibly the gasoline could get in the water supply. Then we found that there was a filling station that had a leak in its gas tank. That got down in a declivity of the ground and the water was just passing under it, and as the water got under it the gasoline was naturally on top of the water and just a thin film of that would be swept in. It is easy to say, but until we discovered that--naturally the filling station plugged the leak in its tank and we stopped it. But very often you will get these problems that really require some adroit detective work before we can handle them.

Federal Cement Tile.

MR. MILLER: This is a small industry that is located on the Grand Calumet, almost at the State line, and it was required because it could not get into the Hammond Sanitary District to put in its own sanitary waste treatment facility, install a package plant with effluent chlorination, and this is complying with the requirements of the Conference.

MR. STEIN: O. K.

General American--is it Transfer Company or Transportation?

MR. MILLER: Transportation Corporation, East Chicago.

General American Transportation Corporation has connected sanitary wastes and industrial wastes to the East Chicago Sanitary Sewerage System and is in compliance with the requirements of the Conference.

MR. STEIN: All right.

How about Inland Steel?

MR. MILLER: Inland Steel Company has its own treatment plants for treating sanitary wastes with effluent chlorination.

During 1968 the Company completed construction of additional settling basins and recirculation facilities at the Coke Quenching Station in the No. 2 and No. 3 coke plants, additional settling basins and in-plant controls in No. 2 and No. 3 blast furnace areas, and deep well disposal systems for waste pickle liquor.

Construction is progressing very well on the waste treatment facilities for the new 12-inch merchant mill. The facilities will be completed and ready for operation when the mill operations are begun during the second quarter of 1969. I might say this is an entirely new facility.

The landfill for the location of the terminal settling and oil skimming basin has been completed and the site is being prepared. Construction of the facilities will start when the fill has adequately settled. A summary of the Company's projects appears in Table 1.

Completion of the proposed projects will provide adequate waste control.

Mr. Chairman, I would like to call on John Brough of Inland Steel Company to make a presentation on the details of their project.

MR. STEIN: Table 1, I assume you are going to submit that for the record?

MR. POOLE: Yes.

MR. MILLER: We would like to have the whole report submitted for the record.

MR. STEIN: Without objection, the whole report will be entered into the record as if read.

P. E. Miller

(Which said report is as follows:)

PROGRESS REPORT
FOR
CONFERENCE
ON

GRAND CALUMET RIVER, LITTLE CALUMET RIVER, CALUMET RIVER, LAKE MICHIGAN, WOLF LAKE AND TRIBUTARIES

(INDIANA-ILLINOIS)

RECONVENED DECEMBER 11, 1968
CHICAGO, ILLINOIS

ON BEHALF OF
THE
STREAM POLLUTION CONTROL BOARD OF THE STATE OF INDIANA
DECEMBER 1968

INTRODUCTION

The Stream Pollution Control Board promulgated the water quality criteria adopted by the

Conferees for water covered by the Conference on February 2, 1966. In addition, criteria were developed and promulgated for the Indiana Harbor Canal with the control point at the inner harbor light.

In compliance with the Federal Water Quality Act of 1965, the criteria and plans of implementation were submitted to the Secretary of the Interior on June 15, 1967. The Secretary approved the interstate standards on July 18, 1967.

The Plans of Implementation state the Board will require the following:

1. Expansion of treatment facilities will be required by Hammond on or before the end of 1972. (Hammond will have to provide up to 95 percent treatment to meet water quality requirements in the Grand Calumet River.)
2. Installation of advanced waste treatment will be required at East Chicago, Gary, Hammond. and Michigan City as soon as practicable and at Crown Point, Hobart and Valparaiso by 1977.
3. The municipalities of Hammond and Whiting will be required to provide treatment and disinfection of sewage and stormwater overflows

from the Robertsdale, Atchison Avenue and Front Street outlets to Lake Michigan on or before the end of 1970. The municipalities of East Chicago, Gary, Hammond and Michigan City with storm and/or combined sewer overflows will be required to provide disinfection and control of pollution from these overflows as soon as practicable.

4. Secondary treatment will be required at all new installations.

All industries will be required to provide a degree of treatment or control that is equivalent to that required of municipalities on the same stretch of the stream. Except in rare instances this will be the equivalent, at least, of secondary treatment. Exceptions must be justified to the satisfaction of the Indiana Stream Pollution Control Board and the Federal Water Pollution Control Administration.

In addition, in accordance with the Recommendations of the Conferees of the Conference of Lake Michigan and Tributaries, the municipalities tributary to Lake Michigan will be required to provide year-around effluent disinfection by May 1969, and to achieve at least 80 percent reduction of total phosphorus by December 1972. Pollution from combined sewers is to be controlled by July 1977.

Municipal Sewage Treatment

All sewage treatment plants serving Indiana municipalities in the Conference area provide secondary treatment and effluent chlorination. Projects completed since the first convening of the Conference in March 1965, include new sewage treatment plants, including effluent chlorination at Dyer and Schererville; plant expansion at Crown Point, effluent chlorination facilities for Hammond, Gary and East Gary and improvements to chlorination facilities at East Chicago and Valparaiso; and completion of a sewer project and connection to the Gary Sanitary District for the Merrillville Conservancy District. The Merrillville project now has approximately 2,500 service connections serving an estimated 10,000 population equivalent.

An interceptor sewer project constructed by the Hammond Sanitary District provides additional capacity to intercept sewage from the south side of Hammond, Griffith and Highland, some of which formerly discharged to the Little Calumet River. The Town of

Highland completed the construction of sewers and lift stations and a connection to the Hammond interceptor sewer for the rest of the Town sewage.

In compliance with a Stream Pollution Control Board order, which required the Town of Porter to provide adequate sewage treatment facilities, the Town has a project under way for discharging its sewage to the Town of Chesterfield for treatment. The City of Portage has received construction bids on final plans and specifications including phosphate removal for a new sanitary sewer system and an activated sludge-type sewage treatment plant. Applications have been filed for Federal grants; however, funds available under PL 660 for fiscal 1968-69 were not sufficient to reach this project. Efforts are also being made to obtain Federal assistance on the sewer system.

The East Chicago Sanitary District has submitted final plans and specifications for sewer separation to serve a large urban renewal area and adjacent area in the northeast part of the City. The Hammond Sanitary District has received preliminary engineering reports on proposed plant improvements and for sewer separation and disinfection of stormwater discharges from the Robertsdale station to Lake Michigan. The City of Whiting is giving consideration to the problem of providing adequate facilities for combined sewer overflows and stormwater discharges to Lake Michigan. The Gary Sanitary District has retained consulting engineers for a preliminary report on needed sewage treatment improvements including planning for advanced waste treatment and phosphate reduction. The Town of Dyer and Griffith are considering preliminary reports for separation of combined sewers.

The East Chicago Sanitary District has completed the first phase of an advanced waste treatment project and has contracted for the construction of a 0.75 million gallons per day plant. In addition, the District has advertised for construction bids for a stormwater demonstration project. Grants from the Federal Water Pollution Control Administration are helping support these projects. The Hammond Sanitary District is considering participation in a research project to demonstrate the feasibility of sewer flushing as a means of minimizing the pollutional effect of overflows from combined sewer systems. A demonstration grant application will be filed for financing this project.

Details on the discharge or proposed discharge of industrial wastes to municipal sewer systems are covered under the discussions on industrial waste.

Semi-Public Sewage Treatment

Eighteen plants are providing effluent chlorination and one plant has chlorination facilities under construction. Five plants include a seven-day terminal lagoon as part of the treatment facilities. Four plants have made or are making sewage works improvements.

A State Board of Health hearing was held regarding inadequate sewage disposal facilities for the Cressmoore Mobile Home Park. An order was issued for connection to the City of Hobart sanitary sewer system. As the State Board of Health order was not complied with, the case was filed in the Lake County Circuit Court. A hearing was held in the Circuit Court and a court order was issued for connection to the Hobart sewer system.

Five plants have been abandoned and connections made to the Merrillville Conservancy District sewer system. The Independence Hill area has formed a Conservancy District which is negotiating with the

Merrillville Conservancy District for sewage disposal service. Two other plants have been abandoned and connections made to the Dyer sewer system.

Surveillance of semi-public installations continues to improve operation of facilities. Continued efforts are made toward obtaining connections to municipal sewer systems.

Industrial

Significant progress has been made on construction of waste treatment facilities at Indiana industries. Twenty-five industrial plants continue to provide effluent monitoring programs and submit the data each month to the Board. One industry (Adolph Plating, Inc., East Chicago) has yet to accomplish this. Eight industries have not been required to establish monitoring programs. They are as follows:

Vulcan Materials Company, Metallics Division, Gary
U. S. S. Lead Refinery, Inc., East Chicago
General American Transportation Corporation, East Chicago
American Steel Foundries, Inc., East Chicago
Commonwealth Edison Company of Indiana, Hammond
Union Tank Car Company, Whiting

Berry Refining Company, Gary (Plant closed)

M & T Chemicals, Inc., East Chicago

Monitoring at Calumet Nitrogen Products Company, Hammond, ceased when the plant closed in August 1968. All other monitoring programs will be maintained or expanded as required to maintain controls.

On October 26, 1967, a meeting was held before the Stream Pollution Control Board and testimony was heard from representatives of the three major steel industries (Youngstown Sheet & Tube Company, Inland Steel Company, and U. S. Steel Corporation) concerning time schedules for construction of waste treatment facilities at Indiana's steel mills and reasons why construction of certain facilities could not meet the December 31, 1968, compliance date outlined by the Conferees. A summary of the projects proposed by the industries and the old and new completion dates are shown in Table I. Note the reductions in time for the new completion dates when compared to the dates previously committed by the industries to the Board. In giving consideration to completion dates beyond December 31, 1968, the Board considered the following major items:

1. Complexity and magnitude of the job.

2. Time required for site preparation prior to start of construction.

3. Availability of skilled labor in the area.

The Board, after careful consideration of the proposed time schedules and the reasons why certain projects could not comply, gave approval on December 19, 1967, to the time schedules proposed and required that the industries submit a progress report on construction of the proposed facilities every six months.

In order to provide more adequate surveillance of industries in the Lake and Porter County areas and continuing inspections of waste treatment facilities under construction, an additional sanitary engineer has been employed and stationed in the area.

Industrial Waste Treatment

Grant Calumet-Indiana Harbor Canal-Lake Michigan

Vulcan Materials Company, Metallics Division, Gary

Inspections by representatives of the Board and results of effluent analyses show that adequate waste control is being maintained.

Cities Service Oil Company, East Chicago

The Company has continued to improve in-plant controls. Work will continue on in-plant controls and if studies show that an additional control of threshold-odor substances or other contaminants is needed, the necessary control will be required.

E.I. du Pont de Nemours & Company, Inc., East Chicago

The Company has completed improvements to the acid neutralization facilities and the settling facilities for diatomaceous earth used as a filter aid in the Ludox operation. These facilities are in operation and performing satisfactorily. Construction is near completion on a new gas-fired powerplant. Use of East Chicago City water for makeup to the boilers will eliminate water treatment sludges presently encountered from treatment of Grand Calumet River water. Brine from regenerating zeolite water softening facilities for the boilers will be stored and discharged slowly to the receiving stream. This construction will be completed by the end of 1968.

A fire during 1968 caused extensive damage to the Company's chlorides manufacturing building and the manufacturing operation has been discontinued. To date, the Company's plans are not to restart the operation. Approximately 6,000 pounds per day of chlorides and 500 pounds per day of zinc have been eliminated with discontinuance of this operation.

Inspections by representatives of the Board and effluent analyses show that the Company is providing adequate waste control. The Company will be required to maintain the effluent monitoring program and provide satisfactory operation of waste treatment facilities.

U. S. S. Lead Refinery, Inc., East Chicago

Inspections by representatives of the Board and results of effluent analyses show that adequate waste control is being maintained.

General American Transportation Corporation, East Chicago

All wastewater continues to be discharged to the East Chicago Sanitary District sewerage system and adequate waste control is being maintained.

Blaw Knox Company, East Chicago

Inspections by representatives of the Board and results of effluent analyses show that adequate waste control is being maintained.

American Steel Foundries, East Chicago

Inspections by representatives of the Board and results of effluent analyses show that adequate waste control is being maintained.

Union Carbide Corporation, Linde Division, East Chicago

Inspections by representatives of the Board and results of effluent analyses show that adequate waste control is being maintained.

Mobil Oil Company, East Chicago

Inspections by representatives of the Board show that construction on proposed waste control projects is proceeding very well and although equipment deliveries caused a 60-day delay in the start of construction, it appears that construction can be completed by December 31, 1968. The project consists of an air flotation facility for additional treatment of the refinery effluent and reuse of the treated effluent for cooling tower makeup.

Since September 1968, the bottoms from the sour water stripper have been added to the cooling tower makeup water and the phenolics and organics substantially reduced by biological action in the cooling tower. These wastes were formerly planned for discharge to the East Chicago Sanitary District sewerage system.

Completion of the Company's water pollution control facilities will be made by December 31, 1968.

Calumet Nitrogen Products Company, Hammond

The Company ceased all operations at the plant on August 1, 1968. Adequate waste control was provided during 1967.

Union Tank Car Company, Whiting

The Company completed construction of a lift station during December 1967, that conveys all industrial waste after oil separation to the Hammond Sanitary District sewerage system. Inspections by representatives of the Board show that adequate waste control is being provided.

Sinclair Refining Company, East Chicago

The Company completed construction of the following projects during 1968: (1) sewers, sumps, pumps and force mains to convey water drawoff from storage tanks in the north and south tank farms for treatment in existing oil separation facilities; (2) a sludge dewatering tank to handle treatment sludges; (3) an oil boom on the Lake George Branch of the Indiana Harbor Ship Canal; (4) two 55,000-barrel storage tanks and pumping station to pump and store contaminated stormwater flow that exceeds the design capacity of the API oil separator for later treatment through the separator; and (5) a presettling tank equipped with mechanical sludge and oil skimming equipment ahead of the existing API oil separation tank. The facilities are now in the initial phase of start of operation. The completed projects fulfill the Company's commitment to complete these facilities by December 31, 1968.

At previous meetings of the Conferees, the Board has outlined that additional removal of BOD and threshold-odor producing substances was needed at Sinclair Refining Company. In order to achieve this, the Company is conducting engineering studies for design of advanced waste treatment facilities. The time schedule for the advanced waste treatment program, approved by the Stream Pollution Control Board on November 18, 1968, is as follows:

1. Completion of engineering studies - May 1, 1969
2. Submission of final plans - July 1, 1969
3. Completion of construction - August 1, 1970.

U. S. Gypsum Company, East Chicago

Inspections by representatives of the Board and the results of effluent analyses show that adequate waste control is being maintained.

Youngstown Sheet and Tube Company, East Chicago

Construction was completed during late 1967 on the gas cleaning and recirculation system for the No. 2 Open Hearth operation and the waste pickle liquor collection facilities for the No. 1 Tin Mill. During early 1968 the No. 3 Hot Strip Mill waste treatment facilities were placed in operation. Construction is proceeding on the Buttweld Mill waste treatment facilities which are to be completed by December 31, 1968.

Construction has started on the five remaining projects involving treatment of wastes from the No. 1 and No. 2 Tin Mills, Hot Rolling Mills, No. 2 Cold Reduced Sheet Mill, Blast Furnaces, and terminal clarification and reuse of wastewater from No. 5 Tandem Rolling Mill, No. 3 Cold Reduced Sheet Mill, and No. 3 Hot Strip Mill. A summary of the projects completed and under construction appears in Table I.

The Company's proposed waste treatment facilities should provide adequate waste control.

Gary Tube Works, U.S. Steel Corporation, Gary

The waste pickle liquor collection system was completed during October 1967, and all spent acids are hauled to the Gary Sheet and Tin Mill for disposal in the deep well disposal system.

The solids and oil skimming facilities for the new Seamless Tube Mill were placed in operation during 1968 when the new mill was started. The effluent from the treatment facility discharges to the terminal solids and oil separation plant.

The terminal solids and oil separation facilities for the total discharge from the Mill was recently completed and is in initial operation. A summary of the Company's projects appears in Table I.

The facilities should provide adequate waste control.

Gary Steel Works, U.S. Steel Corporation, Gary

Construction is proceeding rapidly on the sumps, pumps and piping to convey Coke Plant wastes to the Gary Sanitary District. All construction should be completed by December 31, 1968. The date formerly given for completion of this project was December 31, 1969.

Construction began during September on the settling and oil skimming facilities for the Blast Furnace area, the oil skimming facilities for the Steel Making area and for sewers in the Hot Mills area. A summary of the Corporation's projects appear in Table I.

P. E. Miller

Completion of the proposed facilities should provide adequate waste control.

Gary Sheet and Tin Mill, U.S. Steel Corporation, Gary

Construction has been completed on sewers, sumps, pumps and piping to divert acid rinse waters from the existing 66-inch Continuous Pickling Line and the new 84-inch Continuous Pickling Line to the Terminal Treatment Plant, and sewers, sumps, pumps. and piping to divert oily wastes from the 80-inch 5-Stand Cold Reduction Mill Treatment Plant.

Construction has started on sewers, sumps, pumps and piping to discharge wastewater from the Tin Mill and Sheet Mill to the Terminal Treatment Plant and the addition of additional oil separation and solids removal and chemical treatment facilities at the Terminal Treatment Plant.

Final work on construction drawings is progressing on the facilities to divert the 80-inch Hot Strip Mill scale pits to the 84-inch Hot Strip Mill Filtration Plant and the expansion of filtration facilities at the 84-inch Hot Strip Mill waste treatment plant. A summary of projects for the Mill appears in Table I.

Completion of the proposed facilities

should provide adequate control.

American Bridge Division, U.S. Steel Corporation, Gary

Inspections by representatives of the Board show that only a small amount of cooling water is discharged from the plant and no waste problems exist.

Steiner Tissue Division, Georgia-Pacific Corporation, Gary

On May 21, 1968, the Board issued a pollution abatement order to the Corporation. The order provided that adequate waste treatment must be provided by December 31, 1968.

The Corporation entered into an agreement with the Gary Sanitary District on June 20, 1968, and the Board approved plans and specifications for waste treatment facilities for pretreatment of wastewater prior to discharge to the District's sewerage system on September 17, 1968.

Construction on the pretreatment facilities and the pumps and sewers to connect to the Gary sewerage system is well under way. There has, however, been a delay in delivery of pumps and the drive head for the clarifier mechanism and the facilities cannot be completed by December 31, 1968. The Corporation has requested an extension of time to meet the Board's order.

This matter will be considered at the Board's meeting scheduled on December 17, 1968. The staff will recommend that an extension to March 1, 1969, be granted.

Completion of the proposed facilities and connection to the Gary Sanitary District sewerage system will provide adequate waste control.

Berry Refining Company, Gary

The refinery property has been sold to the Conservation Chemical Company. The Company is investigating the possibility of establishing an operation for recovering ferrous sulfate and ferrous chloride from waste pickle liquor and treatment of oils and various concentrated chemicals. Adequate waste treatment will be required for the operation if there is an installation of recovery facilities.

Northern Indiana Public Service Company, Bailly Station, Baileytown

Inspections by representatives of the Board and effluent analyses show that adequate waste control is being maintained.

Inland Steel Company, East Chicago

During 1968, the Company completed construction of additional settling basins and recirculation facilities at the Coke Quenching Station in the No. 2 and No. 3 Coke Plants, additional settling basins and in-plant controls in the Plant No. 2 and No. 3 Blast Furnace areas and deep-well disposal system for all waste pickle liquor.

Construction is progressing very well on the waste treatment facilities for the new 12-inch Merchant Mill. The facilities will be completed and ready for operation when the Mill operations are begun during the second quarter of 1969.

The landfill for the location of the Terminal Settling and Oil Skimming Basin has been completed and the site is being prepared. Construction of the facilities will start when the fill has adequately settled. A summary of the Company's projects appears in Table I.

Completion of the proposed projects should provide adequate waste control.

Universal Atlas Cement Division, U.S. Steel Corporation, Gary

Inspections by representatives of the Board and results of effluent analyses show that adequate waste control is being provided.

Northern Indiana Public Service Company, Mitchell Station, Gary

Inspections by representatives of the Board and results of effluent analyses show that adequate waste control is being provided.

Union Carbide Corporation, Chemicals Division, Whiting

On June 18, 1968, the Board approved plans and specifications for an equalization tank and sewers, sumps, pumps and piping to convey select wastewater to the East Chicago Sanitary District sewerage system. Construction of the facilities is well under way and will be completed by December 31, 1968.

Completion of the proposed facilities, the results obtained by facilities completed during 1967 and strict in-plant control practices, will provide adequate waste control for all waste contaminants except possibly threshold odor-producing substances. Additional studies must be made after completion of the proposed facilities to determine if further control of threshold odor-producing substances is needed.

American Oil Company, Whiting

During 1968, the Company completed construction of improvements to the cooling water separator and ballast water separation facilities and continued work on in-plant controls to reduce periodic high concentrations of contaminants. The Company has completed all projects proposed for completion by December 31, 1968.

At previous meetings of the Conferees, the Board has outlined that addditional removal of BOD and threshold odor-producing substances was needed at American Oil Company. In order to achieve this, the Company is proceeding with plans for advanced waste treatment facilities. The preliminary plans were approved by the Board on August 20, 1968. The new additions will consist of an air flotation facility to further treat the effluent from the bioflotation facility and an incinerator for handling sludges and waste oil products. The facility is expected to provide 80 percent reduction in threshold odor-producing substances and additional removal of BOD, suspended solids, phenol and oil.

The time schedule approved by the Board for completion of construction of these facilities is December 31, 1970.

American Maize-Products Company, Hammond

The Company completed installation of a

double-effect evaporator in the syrup refinery that has prevented loss of product to the sewer. In-plant housekeeping practices continue to be improved.

Construction has been completed on the conversion of the lagoon system to a totally aerobic system. Six 50-horsepower mechanical aerators have been installed in cell No. 1. The 95-horsepower existing aerators are being maintained in cell No. 2. Cells No. 3 and 4 are not being operated. The effluent from the lagoon system is being discharged to the Hammond Sanitary District sewerage system.

Construction has started on a clarification tank which will enable the Company to convert the operation to an activated sludge operation with aerobic digestion of sludges and final stabilization of the waste in a terminal pond prior to discharge to Lake Michigan. The construction of this facility is scheduled for the first quarter of 1969. In the interim period, the wastewater from the areated lagoon will continue to be discharged to the Hammond Sanitary District sewerage system.

The Company is providing adequate waste control.

Commonwealth Edison Company of Indiana, Hammond

Inspections by representatives of the Board and effluent analyses show that adequate waste control is being provided.

The Company is currently planning improvements to the bottom ash collection and dewatering facilities at the plant. The improvements will probably include filtration of the bottom ash for maximum suspended solids removal.

Little Calumet River - West

Simmons Company, Munster

On April 16, 1968, the Board approved plans and specifications for conversion of the batch treatment facilities for chromium wastes to continuous treatment facilities. Construction of the facilities has been completed.

Inspections by representatives of the Board and results of effluent analyses show that adequate waste control is being provided.

Grand Calumet River - West

Adolph Plating, Inc., Electro Galvanizing Division, East Chicago

On December 19, 1967, the Board issued a pollution abatement order to the industry. The order authorized that adequate waste treatment facilities must be provided by December 31, 1968.

The industry employed an engineer and began work on plans and specifications for waste treatment facilities. Representatives of the Board met with representatives of the industry in July and September to discuss revisions to the plan.

In a letter dated November 1, 1968, the industry advised that in view of the expense of installing waste treatment facilities they were negotiating with the East Chicago Sanitary District concerning connection to the District' sewerage system.

On November 18, 1968, the Board referred the case to the Attorney General for enforcement of the Board's order.

The Board will continue efforts to obtain compliance with the order at the earliest possible date.

LaSalle Steel Corporation, Hammond

On April 16, 1968, the Board approved plans and specifications for acid neutralization and clarification facilities to treat 15,000 gallons per day of wastewater from a new metal finishing line.

P. E. Miller

Construction of the facilities has been completed and the facilities are providing adequate treatment.

M & T Chemicals, Inc., East Chicago

As a result of enforcement action scheduled by the Board on December 19, 1967, the industry stipulated to provide adequate waste control by the end of 1968 and entered into an agreement with the East Chicago Sanitary District for connection of wastewater to the District's sewerage system. Construction of sewers, sumps, pumps, and piping making this connection has been completed and the wastewater is being discharged to the Sanitary District. The industry is providing adequate waste control.

Wolf Lake

Lever Brothers Company, Hammond

The Company has maintained waste treatment and controls to meet the criteria on Wolf Lake. A recovery still has been ordered and will be installed in the fatty acid operation during the first quarter of 1969. The Company reports that a 50-percent reduction in BOD will be obtained. This should improve conditions in Wolf Lake Channel.

P. E. Miller

Summary

1. All municipal sewage treatment plants provide secondary treatment and effluent chlorination. The Town of Porter, the only sewered municipality not served by treatment facilities, has sold bonds and let contracts for the connection of its sewage to Chesterton for treatment.
2. The second phase of a demonstration grant for advanced waste treatment is under way at East Chicago with construction of a 0.75 million gallons a day plant. In addition, construction bids are scheduled for a stormwater demonstration grant in East Chicago, and Hammond is considering a project to demonstrate the feasibility of sewer flushing as a means of minimizing the pollutional effect of overflow from combined sewers.
3. Seven semi-public sewage treatment plants have been abandoned and connections made to municipal sewer systems.
4. Twenty-five industrial plants maintain effluent monitoring programs. Adolph Plating, Inc., has yet to establish a program. The nine remaining industries are not required to maintain effluent monitoring

programs.

5. The Board has requested the Indiana Attorney General to enforce the pollution abatement order issued to Adolph Plating, Inc., Electro Galvanizing Division, East Chicago.

6. Construction of the pre-treatment facilities at the Steiner Tissue Division, Georgia-Pacific Corporation, Gary, has been delayed because of equipment delivery and an extension of time will be considered by the Board at the December 17 Board meeting.

7. Two industries, Mobil Oil Company, East Chicago, and Union Carbide Corporation, Chemicals Division, Whiting, have waste treatment facilities under construction that will be completed by December 31, 1968.

8. Four steel plants, Inland Steel Company and Youngstown Sheet and Tube Company, East Chicago, and Gary Steel Works and Gary Sheet & Tin Mill (U. S. Steel Corporation), Gary, have additional waste treatment facilities planned or under construction with completion time schedules extending beyond December 31, 1968.

9. Two industries, American Oil Company, Whiting, and Sinclair Refining Company, East Chicago, have advanced waste treatment projects planned.

TABLE I

FACILITIES PROPOSED AND UNDER CONSTRUCTION

United States Steel Corporation
Gary Tube Works, Gary, Indiana

Project	Contaminants to be Removed	Old Completion Date	New Completion Date
1. Waste pickle liquor collection system. No discharge to receiving stream.	Acid and iron	12/31/67	Completed
2. Solids clarification and oil skimming facilities.	Oil and suspended solids	12/31/68	Completed

United States Steel Corporation
Gary Steel Works, Gary, Indiana

Project	Contaminants to be Removed	Old Completion Date	New Completion Date
1. Coke Plant - Permanent connection of Coke Plant wastes into the Gary Sanitary District sewerage system and in-plant controls and waste separation.	Ammonia, cyanide, phenols, oils, BOD, and suspended solids	12/31/69	12/31/68
2. Blast Furnace Area - Additional settling basins for flue dust, oil separators in power station and waste segregation.	Oil and suspended solids	6/30/70	12/1/69
3. Steel Making Area - Construction of oil separators and segregation of wastewater with discharge to Blast Furnace Area flue dust settling basins.	Oil and suspended solids	6/30/70	12/31/69
4. Hot Mills Area - Construction of sewers, sumps, pumps, piping and settling and oil skimming basins.	Oil and suspended solids	6/30/70	12/31/69

United States Steel Corporation
Gary Sheet and Tin Mill, Gary, Indiana

Project	Contaminants to be Removed	Old Completion Date	New Completion Date
1. 6-Stand Tandem Cold Reduction Mill facilities.	Suspended solids, free oil, emulsified oils, BOD and iron		Completed

FACILITIES PROPOSED AND UNDER CONSTRUCTION (continued)

	Project	Contaminants to be Removed	Old Completion Date	New Completion Date
2.	84-inch Hot Strip Mill filtration system.	Suspended solids, oil, and iron	--	Completed
3.	Deep well disposal system. No discharge to receiving stream.	Acidity and iron	--	Completed
4.	Acid rinse waters from the existing Sheet and Tin Mill 66-inch Continuous Pickling Line and the New 84-inch Continuous Pickling Line will be diverted to the existing 6-Stand Tandem Cold Reduction Mill waste treatment plant.	Iron, acidity and suspended solids	12/31/68	Completed
5.	Oily wastewater from the 80-inch 5-Stand Cold Reduction Mill treatment plant will be diverted to the 6-Stand Tandem Cold Reduction Mill waste treatment plant.	Suspended solids, free oil, emulsified oil and iron	6/30/68	Completed
*6.	Segregated wastewater from Tin Mill will be discharged to the existing 6-Stand Tandem Cold Reduction Mill waste treatment plant.	Iron, suspended solids, free oil, emulsified oil and BOD	12/31/69	6/30/69
*7.	Segregated wastewater from Sheet Mill will be discharged to the expanded 6-Stand Tandem Cold Reduction Mill waste treatment facilities.	Iron, suspended solids, free oil, emulsified oil and BOD	3/30/70	6/30/69
*8.	Wastewater from the 80-inch Hot Strip Mill scale pits will be diverted to the expanded 84-inch Hot Strip Mill Filtration Plant.	Iron, suspended solids and oil	6/30/70	3/1/70

*In order to handle the additional waste loadings listed in Items Nos. 6 and 7, additional primary solids and oil skimming, flocculation-clarification, and oil and solids handling facilities will be constructed at the 6-Stand Tandem Cold Reduction Mill waste treatment facilities (terminal treatment plant). Additional filtration facilities will be added to the 84-inch Hot Strip Mill waste treatment plant to handle the waste load listed in Item No. 8. The expansion of both the terminal treatment plant and the Hot Strip Mill will be completed by March 1, 1970.

FACILITIES PROPOSED AND UNDER CONSTRUCTION (continued)

Youngstown Sheet and Tube Company
East Chicago, Indiana

	Project	Contaminants to be Removed	Old Completion Date	New Completion Date
1.	Coke Plant - Construction of napthalene scrubbers and connection of waste to the East Chicago Sanitary District.	Ammonia, cyanide, phenols, oil, BOD, and suspended solids	--	Completed
2.	No. 2 Open Hearth - Clarification facilities, cooling towers and water reuse system. No discharge to receiving stream.	Oil and suspended solids	12/31/67	Completed
3.	No. 3 Hot Strip Mill - Oil and solids removal, chemical flocculation, scale pits, and filtration facilities.	Free oil, emulsified oil, suspended solids, and iron	3/1/68	Completed
4.	Buttweld Mill - Pressure filters.	Oil and suspended solids	12/31/68	12/31/68
5.	No. 1 Tin Mill, No. 2 Tin Mill and No. 2 Cold Reduced Sheet Mill - Central Water Treatment Plant for chemical treatment of oils and suspended solids.	Oil and suspended solids	12/31/69	12/31/69
6.	Hot Rolling Mills - Terminal lagoon for secondary clarification of effluent from lake front scale pit.	Oil and suspended solids	6/30/69	6/30/69
7.	No. 2 Cold Reduced Sheet Mill - Sumps, pumps, and sewers to collect waste pickle liquor; and sumps, pumps, and sewers to collect oily waste.	Acidity, suspended solids, oil, and iron	12/31/69	12/31/69
8.	Blast Furnace - Sewers, sumps, and pumps to collect and recirculate all clarified waste from the Blast Furnace. No discharge to receiving stream.	Cyanide, oil, and suspended solids	6/30/70	6/30/70

Project	Contaminants to be Removed	Old Completion Date	New Completion Date
9. North Lagoon - A settling lagoon to collect treated wastes from the No. 5 Stand of the Tandem Rolling Mill, Sewer No. 23, and the No. 3 Hot Strip Mill. All effluent from the lagoon will be recirculated. No discharge to receiving stream.	Oil and suspended solids	6/30/70	6/30/70
Inland Steel Company East Chicago, Indiana			
1. Permanent connection of Plant Nos. 2 and 3 Coke Plant ammonia still wastes and selected wastes to the East Chicago Sanitary District sewerage system (temporary facility in operation at present time).	Ammonia, cyanide, phenols, oil, BOD and suspended solids	10/1/67	Completed
2. Additional settling basins and recirculation pumps will be installed at the Coke Quenching Stations in Plant Nos. 2 and 3 Coke Plants.	Ammonia, cyanide, phenols, oil, and suspended solids	11/1/68	Completed
3. Plant Nos. 2 and 3 Blast Furnace Area in-plant controls and secondary flue-dust settling basins.	Oil and suspended solids	10/1/68	Completed
4. Deep well disposal system. No discharge to receiving stream.	Acidity, suspended solids, and iron	6/30/68	Completed
5. 12-inch Merchant Mill waste treatment plant.	Oil and suspended solids	12/31/68	New, Mill to start operation in second quarter of 1969.
6. Terminal settling and oil skimming basin.	Oil, suspended solids and iron.	5/1/70	5/1/70

MR. STEIN: Do you want to call on Mr. Brough?

MR. MILLER: He is at the projector now getting ready.

MR. STEIN: Let me ask you while Mr. Brough is coming up, when do you think is the terminal date that we can expect Inland Steel to be in compliance?

MR. MILLER: Let me find it to make sure that I am giving you the true date.

We have a proposed date from the Company, which is in the Table of May 1970.

MR. STEIN: May 1970.

MR. MILLER: May 1, 1970.

MR. POOLE: That I might add, Mr. Chairman, is the terminal plant only. All of the other facilities are either completed now or will be by December 31, 1968.

MR. STEIN: What percentage--maybe Mr. Brough wants to answer this--what percentage of the wastes do you think will be handled by 1968?

MR. POOLE: You will have to direct that to Mr. Brough.

MR. STEIN: All right. But the others will be--let me get this record--it is about 16 months behind the date we set, is that right?

MR. POOLE: Yes.

MR. STEIN: All right.

Mr. Brough.

MR. BROUGH: I think, Mr. Stein, that in my presentation some of these questions will be answered.

INLAND STEEL COMPANY

STATEMENT FOR PRESENTATION BEFORE THE CALUMET AREA-LAKE MICHIGAN CONFERENCE ON WATER POLLUTION

CHICAGO, ILLINOIS, DECEMBER 11, 1968

JOHN R. BROUGH, DIRECTOR, AIR AND WATER CONTROL

MR. BROUGH: Conferees, ladies and gentlemen.

My assignment here today is to review the progress of Inland Steel Company in the abatement of water pollution, and to discuss the status of Inland's water pollution abatement program.

I am sure that it is not necessary for me to review the entire history of water pollution abatement at Inland for the Conferees, since most of you have visited our plant and are familiar with many of our wastewater treatment facilities. It was gratifying to read the complimentary remarks reported in the press from those members of this Conference who visited Inland's Indiana Harbor Works in September of last year.

It has been our experience that those people who have visited our plant to gain firsthand knowledge of some of the problems of pollution abatement in an integrated steel plant and to witness for themselves the measures which we have taken to prevent water pollution are complimentary regarding our program. The Izaak Walton League of America, for example, an alert and aggressive citizens conservation group, awarded Inland a plaque this year in recognition of its efforts to prevent water pollution after a number of League officers visited our plant to view our facilities for the prevention of water pollution.

In order to place in proper perspective the report on Inland's progress in water pollution abatement to this Conference, it should be pointed out that Inland has had a water pollution abatement program for many years. Several of our major water pollution control facilities which are in effective use today are more than 40 years old. For many years Inland has installed water pollution abatement equipment along with each new production facility which may be a source of pollution. In fact most of the abatement facilities which are in service today were installed when the associated production facilities were installed. Prior to the original convening of this Conference in March of 1965, Inland had committed more than $26,000,000 for facilities to prevent water pollution. These facilities include systems for the removal of oil, mill scale, blast furnace flue dust, and coal chemicals from water prior to discharge, as well as several recirculating water systems for the prevention of water pollution.

Also included in our abatement program was the completion more than 20 years ago of a complete sanitary sewerage system and secondary treatment plant. Inland's sewage treatment plants, serving more than 20,000 employees, are approved by the Indiana State Board of Health and Stream Pollution Control Board. These plants provide primary and secondary treatment and effluent disinfection.

The capital funds committed to water pollution prevention in recent years by Inland Steel Company at its Indiana Harbor Works have now risen to more than $50 million. This includes, in addition to the $26 million mentioned before, $17 million for the 12 projects which I described for you on March 15 of 1967 and $7 million for additional projects authorized by our Board of Directors since that occasion. The bulk of this $7 million is associated with two new production facilities now under construction--a recirculating water system and treatment facilities for a new cold rolling mill complex, and a recirculating water system for a new electric furnace and continuous casting shop, where the water will be filtered, cooled in cooling towers and reused.

When I last addressed this Conference in March of 1967, I described a 12-point program of projects under way at that time.

I can now report to this Conference that ten of these porjects have been completed, five in 1967, and five more have been completed this year. Another of these projects--which is a recirculating water system for a new merchant mill--will be on stream when the mill starts operation in the first half of 1969.

The one remaining project--and the most massive and costly of the 12--is a Terminal Treatment Facility to handle the outfalls from a group of older mills which were built between 1916 and 1937. Although there are treatment facilities associated with these mills, this Terminal Treatment Facility is considered necessary to meet today's water quality standards. I shall review this project and explain why the complex engineering and construction problems encountered prevent its completion within the compact time schedule suggested by the Conferees.

The first problem was to find space to build interceptor sewers and treatment facilities. Since no existing land was available, Inland requested permission from the Army Corps of Engineers to fill an 18-acre portion of the turning basin in the Indiana Harbor Ship Canal. In June of 1966 a fill permit was issued by the Army Corps of Engineers. Permission for this landfill was also obtained from the State of Indiana.

Prior to issuance of the fill permit, Inland engaged the services of Hydrotechnic Corporation, an engineering firm specializing in water treatment, to study our waste treatment requirements and to recommend a course of action. Their assignment was subsequently expanded to include the engineering of the Terminal Treatment Plant.

Preliminary plans were submitted to the Indiana Stream Pollution Control Board on December 2, 1966. These plans were approved on February 27, 1967.

Final plans for this project were submitted to the Indiana Stream Pollution Control Board on July 28, 1967, and were approved on August 15, 1967.

As soon as final plans were approved, construction was begun, and has continued since that time. Since the final plans were approved, detailed engineering has been completed, equipment has been ordered and construction contracts have been awarded.

This project is of such magnitude that it could not be completed in the less than 18 months allowed by the Conferees' timetable, following approval of the final plans. Some idea of the scope of this Terminal Treatment Facility is provided by the following facts.

It will occupy an area of 18 acres--
larger than the area occupied by Soldier Field.

This is an engineering drawing of the facility when it is completed.

A little more than a year ago the area
was covered by water more than 28 feet deep.

I wonder if we could turn the lights out so we can see better. The portion outlined in white is the area we are talking about.

One million three hundred thousand cubic yards of fill are required--assuming an average truckload of ten cubic yards, this is one hundred thirty thousand truckloads.

Two hundred fifty thousand cubic yards of material must be excavated to permit the installation of interceptor sewers, manholes, scalping tanks, sumps and building and equipment foundations.

Two million eight hundred eighty thousand pounds of steel reinforcing bar, sheet piling, structural steel and steel plates will be used in completing this facility.

Thirty thousand tons of stone will be used in facing the outer-berm to prevent erosion by water.

Four thousand three hundred thirty feet of interceptor sewers varying in size from twenty-four inches to one hundred eight inches must be laid.

Also included are electrical transmission towers and electrical cables capable of transmitting 2,000 KVA at 13,800 volts, an electrical substation and electrical switch gear for the numerous electrical motors totalling 1,600 horsepower.

Numerous items of large special equipment will be required, such as four 60,000 gpm pumps, four 15,000 gpm pumps, twelve 36" x 168" slide gates, two 22" diameter oil storage tanks and others.

One portion of this project will require an excavation larger than two football fields, the bottom of which will be twenty feet below the water table and will require constant dewatering.

The following are some construction progress photographs. (Referring to slides.)

Inland's Engineering Department, working with our consultants, contractors and equipment suppliers, have estimated that this project will be completed in May 1970. This project is progressing satisfactorily.

In the letter inviting me to speak here today, I was asked to present data regarding the reduction in waste load as a result of completion of facilities. Since some portions of Part 10, Plant 3 Blast Furnaces program, and Part 11, Plant 2 Coke Plant program, have only recently been completed, data presented do not reflect the reduction in waste loads achieved by the completion of these two projects. It should also be borne in mind that waste loads are also affected by such factors as levels of operation, product mixes, raw material used and other factors which are independent of treatment provided. The attached sheets show the recent concentration of pollutants in the outfalls affected by the projects included in our abatement program compared with an appropriate base period. The data submitted show that the concentration of pollutants in the water discharged from Inland's operations is at such low levels that they should not cause violations of the criteria established by this Conference.

I would like to call your attention to Sheet 6, which shows the results from outfalls which will be conveyed to the Terminal Treatment Facility. The reduction in solids and oils have been achieved by a number of in-plant changes and by utilizing temporary lagoons formed by the fill for the Terminal Treatment

Facility.

In this photograph here you can see we have outfalls that come into this area here and flow through these lagoons here, outfalls which flow in here, they flow into a lagoon here, and we have skimmers at these locations which keep the oil from flowing out of the lagoon. Solids settle out in these lagoons and we dredge in here. It is kind of hard to see in this photograph, but there is a crane standing here that is now dredging in this lagoon here, dredges solids out and deposits it. This area here is muck. When we filled this area this muck from the bottom gets pushed up because it is soft, squeezes up like toothpaste and fills up here, and this has to be dredged and removed out before we can complete the facility.

We have the same thing here, some muck that has to be removed.

This is another lagoon which receives two outfalls and we have baffles stretched across this which retain the oil in that lagoon and keep it from going out and solids will settle out in this lagoon also.

To summarize, Inland Steel has made progress towards its stated goal of reducing water pollution through the commitment of large sums of capital; $26 million before 1965 and $24 million since 1965 for a total of $50 million.

Of the twelve water pollution abatement projects undertaken since the convening of this Conference in 1965, ten have been completed. The eleventh will be on stream when the twelve-inch Merchant Mill goes into operation. The twelfth project is on schedule and is expected to be completed in May 1970.

These projects and expenditures demonstrate Inland Steel's continuing cooperation in efforts to abate water pollution.

I thank you.

MR. STEIN: Thank you.

Mr. Brough, how about putting the rest of your statement and tables into the record as if read?

MR. BROUGH: Yes, would you please.

MR. STEIN: Yes. Without objection, that will be done.

(Which said tables are as follows:)

J. R. Brough

RESULTS OF ABATEMENT PROGRAM

Project		Date Completed	Results Shown on:
Part 1	Facilities for Waste Acid Disposal - Deep Well	3-25-68	Sheet 1
Part 2	North End Industrial Waste Lagoon Improvement	3-1-67	Sheet 2
Part 3	Wastewater Treatment Facilities for the 12" Merchant Mill	New Operation Est. May 1969	Not Applicable
Part 4	Wastewater Automatic Samplers	9-1-67	Not Applicable
Part 5	Increasing Capacity of Coke Plant Cooling Towers	5-6-67	Sheet 3 for Plant 2 Sheet 4 for Plant 3
Part 6	Lime Still Waste Liquor Disposal	12-1-67	Sheet 3 for Plant 2 Sheet 4 for Plant 3
Part 7	No. 3 A.C. Station Boiler Feedwater Treatment System	12-11-67	Sheet 5
Part 8	Terminal Treatment Facility	Est. 5-31-70	Sheet 6

J. R. Brough

Project		Date Completed	Results Shown on:
Part 9	Plant 2 Blast Furnaces Water Pollution Abatement	9-30-68	Sheet 7
Part 10	Plant 3 Blast Furnaces Water Pollution Abatement	11-30-68	Sheet 8
Part 11	Plant 2 Coke Plant Water Pollution Abatement	11-30-68	Sheet 3
Part 12	Plant 3 Coke Plant Water Pollution Abatement	9-13-68	Sheet 4

Sheet 1

Project: Part 1

Outfalls affected: 13H-1, 15H-1, 15H-2, 15H-3

Pollutants to be reduced: pH and iron

OUTFALL 13H-1

	Concentrations(3)	
Pollutant	Base Period(1)	Recent Period(2)
pH	6.3	8.1
Total Iron	42 ppm	4 ppm

OUTFALLS 15H-1, 15H-2, 15H-3

	Concentrations(3)	
Pollutant	Base Period(4)	Recent Period(5)
pH	4.8	7.7
Total Iron	40 ppm	10 ppm

J. R. Brough

(1) Base period - May 1965

(2) Recent period - May through October 1968

(3) All concentrations reported are net

(4) Base period - May 1965 Concentrations are weighted average of 15H-1 and 15H-2

(5) Recent period - September and October 1968. Concentrations are for 15H-3, which is the outfall from a lagoon receiving Outfalls 15H-1 and 15H-2.

Sheet 2

Project: Part 2

Outfall affected: 24N-1

Pollutants to be reduced: Suspended solids, oil

	Concentrations(3)	
Pollutant	Base Period(1)	Recent Period(2)
Suspended solids	18 ppm	11 ppm
Oil	11 ppm	7 ppm

(1) Base Period - May 1965

(2) Recent Period - First 10 months of 1968

(3) All concentrations are net

Sheet 3

Project: Part 5, Part 6, Part 11

Outfall affected: 13H-1

Pollutants to be reduced: Ammonia, Cyanide and phenol

Pollutants	Concentrations(3) Base Period(1)	Concentrations(3) Recent Period(2)
Ammonia-N	2.89 ppm	1.68 ppm
Phenol	1.309 ppm	0.371 ppm
Cyanide	0.92 ppm	0.22 ppm

(1) Base Period - May 1965

(2) Recent Period - First 10 months of 1968. Effect of completion of Part 11 does not show in these figures since this project was just completed on November 30, 1968, insufficient test data have been collected to be considered significant.

(3) All concentrations are net.

Sheet 4

Project: Part 5, Part 6 and Part 12

Outfall affected: 4E-1

Pollutants to be reduced: Ammonia and phenol

Pollutant	Concentrations(3) Base Period(1)	Concentrations(3) Recent Period(2)
Ammonia-N	1.34 ppm	0.69 ppm

Phenol	0.758 ppm	0.007 ppm

(1) Base Period - May 1965

(2) Recent Period - First 10 months of 1968. Although final completion date for all projects was September 13, 1968, all abatement objectives were accomplished through temporary means in 1967.

(3) All concentrations are net.

Sheet 5

Project: Part 7

Outfall affected: 4E-1

Pollutant to be reduced: Phosphate

Quantity of disodium phosphate used to treat boiler water at No. 3 A.C. Station has been reduced from an average of 195 pounds per day in 1967 to 53 pounds per day in 1968.

Sheet 6

Project: Part 8

Outfalls affected: In 1965 Outfalls 13H-1, 14K-2, 13K-2, 15H-1 and 15H-2.

In August 1968 these were combined into two Outfalls 13H-1 and 15H-3.

Pollutants to be reduced: Suspended solids and oil

Pollutant	Concentrations(3)	
	Base Period(1)	Recent Period(2)
Suspended solids	41 ppm	16 ppm
Oil	31 ppm	4 ppm

(1) Base Period - May 1965

(2) Recent Period - September and October 1968

(3) All concentrations reported are net, weighted averages

Sheet 7

Project: Part 9

Outfall affected 13G-1

Pollutant to be reduced: Suspended solids

Pollutant	Concentrations (3)	
	Base Period(1)	Recent Period(2)
Suspended solids	25 ppm	10 ppm

(1) Base Period - May 1965

(2) Recent Period - First 10 months of 1968

(3) All concentrations are net

Sheet 8

Project: Part 10

Outfall affected: 4E-1

Pollutant to be reduced: Suspended solids

J. R. Brough

Pollutant	Concentrations[3]	
	Base Period[1]	Recent Period[2]
Suspended solids	22 ppm	10 ppm

(1) Base Period - May 1965

(2) Recent Period - First 10 months of 1968

(3) All concentrations are net

MR. BROUGH: I will be glad to read them, if you want me to.

MR. STEIN: No, thanks.

Unless anyone has a compelling notion here, are there any comments or questions?

MR. POSTON: I have a question.

I would like to ask Mr. Brough if he could give us any idea of what percentage of the wastes of Inland are treated with the treatment facilities that will be in operation on the end of this month?

MR. BROUGH: Well, I would have to answer you that all of the wastes are treated. I am not exactly sure if I know precisely what you are getting at, but I know of no outfall, Mr. Poston, that doesn't get treatment.

MR. POSTON: Well, I understand that you are going to have a new plant that is going to give additional treatment to all of the wastes, your terminal treatment plant. How much more, then, do you expect to be removed when you get this plant in operation?

MR. BROUGH: This terminal treatment plant will not treat all the wastewater that is discharged from Inland Steel Company. It treats a portion of the wastewater, as I mentioned in my report, from a group of older mills. Precisely, I could list these mills for you, if you like, but it is not all the water from Inland Steel Company. Most of the water that is discharged from Inland Steel Company was considered satisfactory before this Conference was convened, and those areas which were not considered satisfactory by the Indiana Stream Pollution Control Board we have taken corrective actions on.

MR. STEIN: Let me try to rephrase this question to see if we can get at what we are trying to get at.

By the way, I want to commend you on the report and the detail of the report. As always, I think we have got a complete and full disclosure from Inland and we know where we stand.

Let me ask you. You say that you are meeting the criteria with the material you are putting out now, if I read your report right, is this correct?

MR. BROUGH: Well, I said, I think I would have to repeat my statement, that the levels of our discharges are so low that they should not cause violations of the criteria.

I don't know that we have any effluent criteria that I could tell you. If I had an effluent criteria I could tell you, yes, I meet this criteria or I do not meet it.

MR. STEIN: Let me ask you, when the terminal plant is in and the facilities are completed in May of 1970 as you propose, how much better do you think you are going to be doing then than you are doing now?

MR. BROUGH: Mr. Stein, you have asked me a very difficult question. The reason it is so difficult is because we are already doing better than the criteria for which this plant was designed.

Now, how much better are we going to do then? I would presume that we will do better, but I don't know if I can give you any promise of how much better. On the average we should improve what we are doing now because obviously this will be a much finer facility than these makeshift operations that we are now living with.

MR. STEIN: Are there any other comments or questions?

MR. POOLE: I just hope the Conferees

understand that that picture he showed of these lagoons, that the waste that will go through the terminal treatment facility when it is finished is now going through these series of lagoons.

MR. BROUGH: There are operation problems when you operate in lagoons. If you dredge you stir up the muck and this is an operating problem, and I think Mr. Klassen and various other people--in other words, the terminal treatment plant will not be--won't have these operating problems associated with it. It will be a much finer facility.

MR. STEIN: I am impressed with your figures, at least I was until you got to that one figure, with your numerous **electrical motors** totalling 1,600 horsepower. I guess American Oil should take note. I think my wife is driving a car with that horsepower in it now. (Laughter.)

Let me ask you another. You say you provide secondary and primary treatment and effluent disinfection for your domestic wastes to the plant.

MR. BROUGH: Yes.

MR. STEIN: Is that year-round disinfection?

MR. BROUGH: Yes, sir.

MR. STEIN: And what BOD removal are you getting in the secondary?

MR. BROUGH: Well, the effluent BOD, I am sorry I don't have the reports, but just speaking from memory, they run around six or seven parts per million.

MR. STEIN: O. K.

Now, before the Conferees leave, because I think this is a key question, the situation that we are dealing with in Inland, if I understand you, Mr. Brough--and let's try to get this because I want to be exactly accurate on it--you are putting in this terminal facility that will be completed in May 1970. However, it does not mean that at the present time you are violating any of the criteria or requirements of the Conference. You have a series of lagoons and a series of treatments which you believe is bringing this up. What you will have with that is a centralized efficient system which should give better results.

MR. BROUGH: Better operations and better results.

MR. STEIN: Is this about it?

MR. BROUGH: Yes.

MR. STEIN: And certainly more ease of controls in handling the results.

MR. BROUGH: Oh, yes.

MR. STEIN: O. K.

Does anyone have any question on that? I think this is a key question.

Any questions or comments?

If not, thank you very much for a very illuminating statement.

Wait a minute.

MR. POSTON: I think that a little later, as our Chairman has indicated, we will come up with some data on the streams out there, that the condition is not markedly improved over 1965, and I wondered whether you had any comment relative to when we come up to the end of the year if we don't have better results at that time what is the reason for this? Or will the facilities that will be installed between now and January 1st take care of all the problems and suddenly show better overnight?

MR. BROUGH: If you are talking about facilities Inland Steel Company will install between now and January 1st, there aren't any. So what we are doing today we should be doing January 1st.

It would be difficult for me to comment, Mr. Poston, on your contention that the streams aren't what they should be unless I know precisely what you are talking about. I know I have read in the newspaper that the Federal Government intends to present data which shows that conditions have gotten worse. If I could see the data, then I would be in a little bit better position to comment.

MR. STEIN: I think it would be better if we proceeded in order. You know, this is a Conference and we don't have, obviously, as you can tell, the strict rules of evidence. But it would be better to put that in first, and then if you have any comment let's hear the comment.

MR. BROUGH: Yes. I don't want to duck your question, but--

MR. STEIN: I recognize that. Thank you very much.

MR. BROUGH: Thank you.

PROGRESS REPORT ON INDUSTRIES IN INDIANA
(CONTINUED)

MR. STEIN: LaSalle Steel.

MR. MILLER: LaSalle Steel Company, Hammond. Sanitary wastes are discharged to the Hammond Sanitary District sewerage system and on April 16, 1968, the Board approved plans and specifications for acid neutralization and clarification facilities to treat 15,000 gallons per day of wastewater from a new metal finishing line. Construction of the facilities has been completed and the facilities are providing adequate treatment and are in compliance with the requirements of the Conference.

MR. STEIN: Do you think that all of the LaSalle field is in compliance?

MR. MILLER: Yes.

MR. STEIN: Thank you. Lever Brothers?

MR. MILLER: Lever Brothers Company, Hammond. Sanitary wastes from this plant and some of the industrial wastes from this plant are discharged to the Hammond sewerage system for treatment by the Hammond

Sanitary District. The Company has maintained waste treatment and control facilities to meet the criteria on Wolf Lake. A recovery program has been ordered and will be installed in the fatty acid operation during the first quarter of 1969. The Company reports that a 50 percent reduction in BOD will be obtained. This should improve conditions in Wolf Lake.

I might say that the Board has a stipulation with this Company and the Board is interested in maintaining the branch of Wolf Lake, the channel which comes up to Indianapolis Boulevard, in satisfactory quality and this is the reason for installation of the recovery still and the Board will continue to see that this is carried out.

MR. STEIN: Let me ask you, they are not in compliance now, I take it?

MR. MILLER: As far as compliance with the control at the State line and Wolf Lake proper, I will have to say that they are in compliance.

As far as the channel itself, that the channel is not in satisfactory condition at this time.

MR. STEIN: Do you think this 50 percent reduction will be enough?

MR. MILLER: Fifty percent reduction, I would say, should go a long way in providing satisfactory water quality in the channel. This is a question in the channel that the only source of water in Wolf Lake is the discharge of this cooling water which has barometric condenser water in it which maintains the level of Wolf Lake at the present time, and it is one of satisfactory quality without any dilution available in this branch.

MR. STEIN: Let me ask, if the 50 percent does not give satisfactory compliance, are you going to reevaluate the situation?

MR. MILLER: We will continue to reevaluate.

MR. STEIN: Thank you.

M & T Chemicals.

MR. MILLER: M & T Chemical Companies, Inc., East Chicago, discharges domestic wastes to the sanitary sewer system of the East Chicago Sanitary District. As a result of enforcement action scheduled by the Board on December 19, 1967, the industry stipulated to provide adequate waste control by the end of 1968 and entered into an agreement with the East Chicago Sanitary District for connection of wastewater to the District's sewerage system. Construction of sewers, sumps, pumps, and piping making this connection has been completed and the wastewater is being discharged to the Sanitary District. The industry is providing adequate waste control and is in compliance with the requirements of the Conference.

MR. STEIN: All right.

Midwest Steel.

MR. MILLER: Midwest Steel--and I might add at this stage, you didn't include Bethlehem, which is in the same area--an original No. 3 Conclusion of the Conferees was that there was no evidence of interstate pollution from the discharges in the Burns Ditch area in Indiana. However, both of these plants, Midwest and Bethlehem, do have activated sludge-type plants with continuous chlorination for handling domestic wastes, and they have industrial waste treatment facilities throughout the mill and these industrial waste treatment facilities are adequate and are in compliance with the requirements of the Conference.

MR. STEIN: Mobil Oil.

MR. MILLER: Mobil Oil Company, East Chicago. Domestic wastes are discharged to the East Chicago sewerage system for treatment by the Sanitary

District.

Inspections by representatives of the Board show that construction on proposed waste control projects is proceeding very well and although equipment deliveries caused a 60-day delay in the start of construction, it appears that construction can be completed by December 31, 1968. The project consists of an air flotation facility for additional treatment of the refinery effluent and reuse of the treated effluent for cooling tower makeup.

Since September 1968 the bottoms from the sour water stripper have been added to the cooling tower makeup water and the phenolics and organics substantially reduced by biological action in the cooling tower. These wastes were formerly planned for discharge to the East Chicago Sanitary District sewerage system.

Completion of the Company's water pollution control facilities will be made by December 31, 1968, and we will continue to keep this one under surveillance in regard to the threshold odor and BOD which we have indicated in the past would be looked at as far as additional requirements and control are concerned.

MR. STEIN: Is it your view that they are going to complete it by December 31,1968?

MR. MILLER: This is our view, and from discussions with the Company they indicate that they believe it will be completed.

MR. STEIN: When this is completed the State will be conducting these tests on threshold odors and other problems, right?

MR. MILLER: We will be doing this.

MR. STEIN: And that will be made available to the Conferees?

MR. MILLER: Yes.

MR. STEIN: Thank you.

Northern Indiana Public Service ompany, Baileytown.

MR. MILLER: This plant has a septic system with absorption for handling the domestic wastes and inspections by representatives of the Board and effluent analysis show that adequate waste control is being maintained and it is in compliance with the requirements of the Conference.

MR. STEIN: How about Northern Indiana Public Service Company in Gary?

MR. MILLER: Northern Indiana Public

Service Company, Mitchell Station in Gary, has a septic system--I believe this one has a sand filter and then ties into the cooling water discharge, which is chlorinated. But inspections by representatives of the Board and results of effluent analysis show that adequate waste control is being provided and I would consider this in compliance with the requirements.

MR. STEIN: Do they chlorinate all the cooling water or just the water coming out of the septic tank?

MR. MILLER: No, no, they chlorinate the cooling water discharge.

MR. STEIN: All of it?

MR. MILLER: Yes.

MR. STEIN: That is interesting. How come?

MR. MILLER: I should say it is not really continuous, it is intermittent, but it is done for slime control, so this is the reason.

MR. STEIN: All right.

Simmons Company.

MR. MILLER: Simmons Company. The domestic wastes are discharged into the Munster sewer system which is connected to Hammond and is treated in the Hammond Sanitary District sewage treatment plant.

On April 16, 1968, the Board approved plans and specifications for conversion of the batch treatment facilities for chromium wastes to continuous treatment facilities. Construction of the facilities has been completed.

Inspections by representatives of the Board and results of effluent analyses show that adequate waste treatment is being provided, and this one is in compliance with the requirements of the Conference.

MR. STEIN: Sinclair Refining.

MR. MILLER: Sinclair Refining Company, East Chicago. Domestic wastes are discharged to the East Chicago system for treatment in the District's plant. The Company completed construction of the following projects during 1968:

1. Sewers, sumps, pumps, and force mains to convey water drawoff from storage tanks in the north and south tank farms for treatment in existing oil separation facilities.
2. A sludge dewatering tank to handle

treatment sludges.

3. An oil boom on the Lake George branch of the Indiana Harbor Ship Canal.
4. Two 55,000 barrel storage tanks and pumping station to pump and store contaminated stormwater flow that exceeds the design capacity of the API oil separator for later treatment through the separator.
5. A presettling tank equipped with mechanical sludge and oil skimming equipment ahead of the existing API oil separation tank.

The facilities are now in the initial phase of start of operation. The completed projects fulfill the Company's commitment to complete these facilities by December 31, 1968.

At previous meetings of the Conferees, the Board has outlined that additional removal of BOD and threshold odor-producing substances was needed at Sinclair Refining Company. In order to achieve this, the Company is conducting engineering studies for design of advanced waste treatment facilities. The time schedule for the advanced waste treatment program, approved by the Stream Pollution Control Board on

November 18, 1968, is as follows:

1. Completion of engineering studies by May 1, 1969.
2. Submission of final plans July 1, 1969.
3. Completion of construction by August 1, 1970.

And this one I would say is in the category with American Oil in having fulfilled its commitment to the Board for the construction of facilities by 1968.

MR. STEIN: In other words, you think what they are putting in and going in by 1970 is extra?

MR. MILLER: Right.

MR. STEIN: What do they use that oil boom for?

MR. MILLER: There were sources of oil in the upper branch of the Lake George arm of the Indiana Harbor Canal. Some of these appeared to come in with storm drainage, some of it came in with stormwater runoff from Sinclair's property itself. There was also at one time before Union Tank Car was connected in that it discharged above this point and it was put in to skim the oil so it would not go down the Canal and find its way into Lake Michigan.

MR. STEIN: In other words, the oil boom is used intermittently to handle storm drainage? It isn't a dry-weather flow?

MR. MILLER: No, it was across the canal at all times to skim except when you had to bring a ship in and get beyond it.

MR. STEIN: Do you mean that they have a dry weather flow of oil out into the canal?

MR. MILLER: No, but there is oil in the area that blows around by the wind and it is a question of how you skim this and get it off. So this was done as a preventive measure until all things could be brought under control.

MR. STEIN: Let me ask you a question. About how frequently is that oil boom used, pretty regularly?

MR. MILLER: Well, let's say it was put across and maintained across at all times, and then there was some difficulty with the skimming device and it was not across. It is my understanding now that it is back in use and is across the Indiana Harbor Ship Canal.

MR. STEIN: All right. But you know, I suggest that this may be something to look into, because unless we are getting a runoff during stormwater, and that may be something we can't help, the controls on oil should be to prevent them from getting into the water courses first and not to use a boom after they are in there to get them out.

Except for a temporary measure, this doesn't seem to be a very satisfactory way of handling the problem.

MR. MILLER: I agree with you 100 percent, Mr. Chairman. The only problem, and this comes back to the issue about the storm sewer that we discussed earlier, that there do appear to be in this area or does appear to be oil on the ground water and as the ground water table fluctuates this is carried out.

MR. STEIN: Right.

MR. MILLER: So it is a problem that is involved with the ground water level as well, and the indications are from the work being done at the tank farm and also by these large 50,000 barrel storage tanks that we are trying to solve this problem before it does get there.

MR. STEIN: Steiner Tissue of Georgia-Pacific.

MR. MILLER: Steiner Tissue Mill or Steiner Tissue Division, Georgia-Pacific Corporation, Gary. Domestic wastes are discharged to the Gary Sanitary District for treatment.

On May 21, 1968, the Board issued a pollution abatement order to the Corporation. The order provided that adequate waste treatment must be provided by December 31, 1968.

The Corporation entered into an agreement with the Gary Sanitary District on June 20, 1968, and the Board approved plans and specifications for waste treatment facilities for pretreatment of wastewater prior to discharge to the District sewerage system on September 17, 1968.

Construction on the pretreatment facilities and the pumps and sewers to connect to the Gary sewerage system is well under way. There has, however, been a delay in delivery of pumps and the drive head for the clarifier mechanism and the facilities cannot be completed by December 31, 1968. The Corporation has requested an extension of time to meet the Board's order. This matter will be considered at the Board's meeting scheduled on December 17, 1968. The staff will recommend that an extension to March 1, 1969, be granted.

Completion of the proposed facilities and connection to the Gary Sanitary District sewerage system will provide adequate control and would bring it into compliance with the requirements of the Conference.

MR. STEIN: That would just be a three-month extension?

MR. MILLER: Right.

MR. POOLE: Two.

MR. MILLER: Two. No, wait--yes, it is two.

MR. STEIN: Two-month extension, that is right. I stand corrected.

Union Carbide, Chemicals Division.

MR. MILLER: The Union Carbide Chemicals Division domestic wastes are discharged to the Whiting sewerage system for treatment by the Hammond Sanitary system.

On June 18, 1968, the Board approved plans and specifications for an equalization tank and sewers, sumps, pumps, and piping to convey select wastewater to the East Chicago Sanitary District sewerage system. Construction of the facilities is well under way and will be completed by December 31, 1968.

Completion of the proposed facilities, the results obtained by facilities completed during 1967, and strict in-plant control practices, will provide adequate waste control for all waste contaminants except possibly threshold odor-producing substances. Additional studies must be made after completion of the proposed facilities to determine if further control of threshold odor-producing substances is needed.

In this work the selected wastes are indicated to be those that would have high threshold odors. If they are successful in picking these up, then this one will be in compliance, but we will keep it under surveillance to ascertain.

MR. STEIN: That falls into shape like several of the others when-- And by the way, this may tie in to the later reports, without prejudging this. Sinclair is going beyond what we have required, American Oil is going beyond what we required, Union Carbide may have to. This will be in compliance. We do recognize that we very well may have a further problem, even though they are in compliance, with a possible threshold odor problem at several of these plants which may need further work.

Now, I should emphasize--correct me if I am wrong--that the major part of the work is being done to get these in compliance.

MR. MILLER: That is correct.

MR. STEIN: The question of handling the threshold odor, and I am just speaking comparatively, relating to the regular work will in large measure be a refinement. Is this about correct?

MR. MILLER: This is correct.

MR. STEIN: All right.

Union Carbide, Linde Division.

MR. MILLER: The Linde Division is in East Chicago and domestic wastes are discharged to the East Chicago system for treatment at the District plant.

Inspections by representatives of the Board and results of effluent analyses show that adequate waste control is being maintained and this plant is in compliance with the requirements of the Conference.

MR. STEIN: Union Tank Car.

MR. MILLER: Union Tank Car, Whiting. I believe the domestic wastes here are discharged to the Hammond Sanitary District for treatment in the District's plant.

The Company completed construction of a lift station during December 1967 that conveys all industrial waste after oil separation to the Hammond Sanitary District sewerage system. Inspections by representatives of the Board show that adequate waste control is being provided, and this plant is in compliance with the requirements of the Conference.

MR. STEIN: U. S. Gypsum Company.

MR. MILLER: U. S. Gypsum Company, East Chicago. There again domestic wastes are discharged to the East Chicago sewerage system for treatment in the District's plant.

Inspections by representatives of the Board and results of effluent analyses show that adequate waste control is being maintained and this plant is in compliance with the requirements of the Conference.

MR. STEIN: I don't know why we have got an extra "S" on this, U. S. S. Lead Refinery.Have we got an extra "S" on that?

MR. MILLER: No, no, it belongs in there. I don't know what it is either, Mr. Chairman, but the correct name is U. S. S. Lead Refinery, Inc., East

Chicago.

MR. STEIN: I thought that was the way they rechristened that Navy ship.

MR. MILLER: Domestic wastes from this plant are discharged to the East Chicago sewerage system for treatment in the District's plant.

Inspections by representatives of the Board and results of effluent analyses show that adequate waste control is being maintained and this plant is in compliance with the requirements of the Conference.

MR. STEIN: U. S. Steel, American Bridge.

MR. MILLER: U. S. Steel, American Bridge, Gary.

MR. STEIN: No, no--yes, Gary, that is right.

MR. MILLER: U. S. Steel Corporation, Gary. In this one, the domestic wastes are discharged--

MR. STEIN: We are just talking about American Bridge now, not the other plants. Not the Gary Sheet and Tin or the National Tube.

MR. MILLER: Let me say this, domestic wastes from all the U. S. Steel facilities in Gary are discharged to the Gary sewerage system for treatment in the Gary treatment plant, so this would apply to all of them. And American Bridge has only cooling water, so this would bring this plant into compliance at least with the requirements of the Conference.

MR. STEIN: How about Gary Sheet and Tin?

MR. MILLER: All right, I would like to read the Gary Sheet and Tin, Gary Steel Works and the Tube Works, and then call on Mr. Dunsmore.

MR. STEIN: All right. Here, we have the Gary Sheet and Tin, we particularly want to get into acid neutralization, deep well disposal, treatment of cold reduction tin mills and the 84-inch strip mill.

MR. MILLER: All right, let me read this one.

Gary Sheet and Tin Mill, U. S. Steel Corporation, Gary.

Construction has been completed on sewers, sumps, pumps, and piping to divert acid rinse waters from the existing 66-inch continuous pickling line and the new 84-inch continuous pickling line to the terminal treatment plant, and sewers, sumps, pumps, and piping to divert oily wastes from the 80-inch 5-stand cold reduction mill treatment plant.

Construction has started on sewers, sumps, pumps and piping to discharge wastewater from the tin mill and sheet mill to the terminal treatment plant and the addition of additional oil separation and solids removal and chemical treatment facilities at the terminal treatment plant.

Final work on construction drawings is progressing on the facilities to divert the 80-inch hot strip mill scale pits to the 84-inch hot strip mill filtration plant and the expansion of filtration facilities at the 84-inch hot strip mill waste treatment plant. A summary of projects for the mill appears in Table I.

Completion of the proposed facilities should provide adequate control.

Do you want me to go ahead--

MR. STEIN: When will this be done? And maybe you can leave this if the industry is going to make a proposal. I am not only interested in that 80-inch strip mill and the 84-inch strip mill, but the 66- and 84-inch tin mill, sheet tin mills..

MR. MILLER: All right.

MR. STEIN: Perhaps it might be better if you finished U. S. Steel with National Tube and then you can call on them to handle all the plants. O. K.?

MR. MILLER: I have got the Gary Works and the Tube Works. Let me take both of these and then call upon Mr. Dunsmore.

MR. STEIN: Right.

MR. MILLER: All right.

Gary Tube Works, U. S. Steel Corporation, Gary.

The terminal solids and oil separation facilities for the total discharge from the mill was recently completed and is in initial operation. A summary of the Company's projects appears in Table I.

This facility should provide adequate waste control.

MR. STEIN: When do you think they will be in compliance, Mr. Miller?

MR. MILLER: O. K., let me read this. I missed it on page 7. I didn't go far enough back. The waste pickle liquor collection system was completed during October 1967. All spent acids are hauled to the Gary Sheet and Tin Mill for disposal in the deep well disposal system.

The solids and oil skimming facilities for the new seamless tube mill were placed in operation during 1968 when the new mill was started. The effluent from the treatment facility discharges to the terminal solids and oil separation plant.

Then what I read should follow. And it is my understanding that this one is now complete and was to be completed by the end of this year for the Tube Works.

Now, Gary Steel Works, U. S. Steel Corporation, Gary.

Construction is proceeding rapidly on the sumps, pumps, and piping to convey coke plant wastes to the Gary Sanitary District. All construction should be completed by December 31, 1968. The date formerly given for completion of this project was December 31, 1969.

Construction began during September on the settling and oil skimming facilities for the blast furnace area, the oil skimming facilities for the steel making area, and for sewers in the hot mills area. A summary of the Corporation's projects appear in Table I.

Completion of the proposed facilities should provide adequate waste control.

MR. STEIN: When will this be done?

MR. MILLER: The blast furnace area is indicated being completed December 1, 1969. The steel making area December 31, 1969. The hot mills area December 31, 1969.

Now, the sheet and tin mill, the dates that I have are on the wastes from the tin mill and the existing 6-stand mill and tandem cold reduction mill waste treatment June 30,1969. Segregated wastewater from the sheet mill will be discharged to the expanded 6-stand tandem cold reduction mill waste treatment facility June 30,1969. And the wastewater from the 80-inch hot strip mill scale pits will be diverted to the expanded 84-inch hot strip mill filtration plant by March 1, 1970.

Now, I would like, Mr. Chairman, to call upon Mr. H. J. Dunsmore--

MR. STEIN: Before he comes up, let me check this with you, and Mr. Dunsmore can speak to this.

In several of these mills you are asking for an 11-month extension, December 1, 1969. Let's go over that again.

MR. MILLER: O. K.

MR. STEIN: December 1. Let's go. Which

one--three of those.

MR. MILLER: In the Gary Works?

MR. STEIN: Yes.

MR. MILLER: The blast furnace area.

MR. STEIN: Blast furnace. All right.

MR. POOLE: And the steel making area and the hot mills is 12 months.

MR. MILLER: Twelve months.

MR. STEIN: Where is that 12 months?

MR. MILLER: Well, it is December 31,1969.

MR. STEIN: Oh, 31st, not 1st?

MR. MILLER: Yes.

MR. STEIN: The blast furnace is December 1st?

MR. MILLER: Right.

MR. STEIN: And the other two are December 31st?

MR. POOLE: Right.

MR. MILLER: Right.

MR. STEIN: Steel making and what is the third one?

MR. MILLER: Hot mills area.

MR. STEIN: Hot mills. All right.

MR. MILLER: Now, sheet and tin, number 6, which is the segregated wastewater from the tin mill. Is six months. It is 6-30-69.

MR. STEIN: Yes, sheet and tin.

MR. MILLER: All right, and the segregated wastewater from the sheet mill will discharge to the expanded 6-stand tandem cold mill in six months. 6-30-69.

MR. STEIN: All right.

MR. MILLER: And the wastewater from the 80-inch hot strip mill is 14, to March 1, 1970.

MR. STEIN: All right. Now again, I don't know that this can be done. But if we could, it would be interesting to get in terms of rough percentages the work that is going to be in compliance. Get the percentages of the work that you are going to ask for or someone is going to ask, presumably, for an 11-month extension, the percentage that someone is going to ask for a 12-month extension, that someone is going to ask for a 6-month extension, i. e., the sheet and tin and the segregated water, and the percentage of work that presumably you are going to ask for 14 months. If there could be sort of a percentage reduction there, if that is possible, or even in gross terms explaining what that can do, I think we would be in better shape.

And I think from the steel company, Mr. Dunsmore, if this is really the request, I think the issues are going to be the question of the bona fide effort of the steel mill to make the deadline set by the Conferees, what possibly the problems were and why you believe this couldn't be done and the extra time you will be needing.

MR. MILLER: We did, Mr. Chairman, ask Mr. Dunsmore to be prepared to answer those.

MR. KLASSEN: Mr. Chairman, just a point of order here.

MR. STEIN: Yes.

MR. KLASSEN: Did I understand you to say that you have requested? I have heard no request.

MR. STEIN: No, I have not. No, that is what I said. I corrected that. I said I am assuming that there might be a request with these dates.

MR. KLASSEN: All right.

MR. STEIN: And if this is so, I would suggest that they would buttress this.

MR. KLASSEN: All right.

MR. STEIN: Because as far as we are concerned, we have had no request yet.

Mr. Miller.

MR. MILLER: This is Mr. H. J. Dunsmore, Assistant to the Administrative Vice President, Engineering, U. S. Steel Corporation.

PROGRESS REPORT OF UNITED STATES STEEL CORPORATION

HERBERT J. DUNSMORE, ASSISTANT TO ADMINISTRATIVE VICE PRESIDENT, ENGINEERING

MR. DUNSMORE: I think my people are ready with the slides.

Chairman Stein and distinguished Conferees.

I want to take this opportunity to present to you what U. S. Steel has done to improve their water quality control facilities since the Conference beginning in 1965 and continuing in 1966 in which you established criteria for Lake Michigan. I am here today to report to you on the advances U. S. Steel has made in our facilities to control the wastes from all of our Gary facilities.

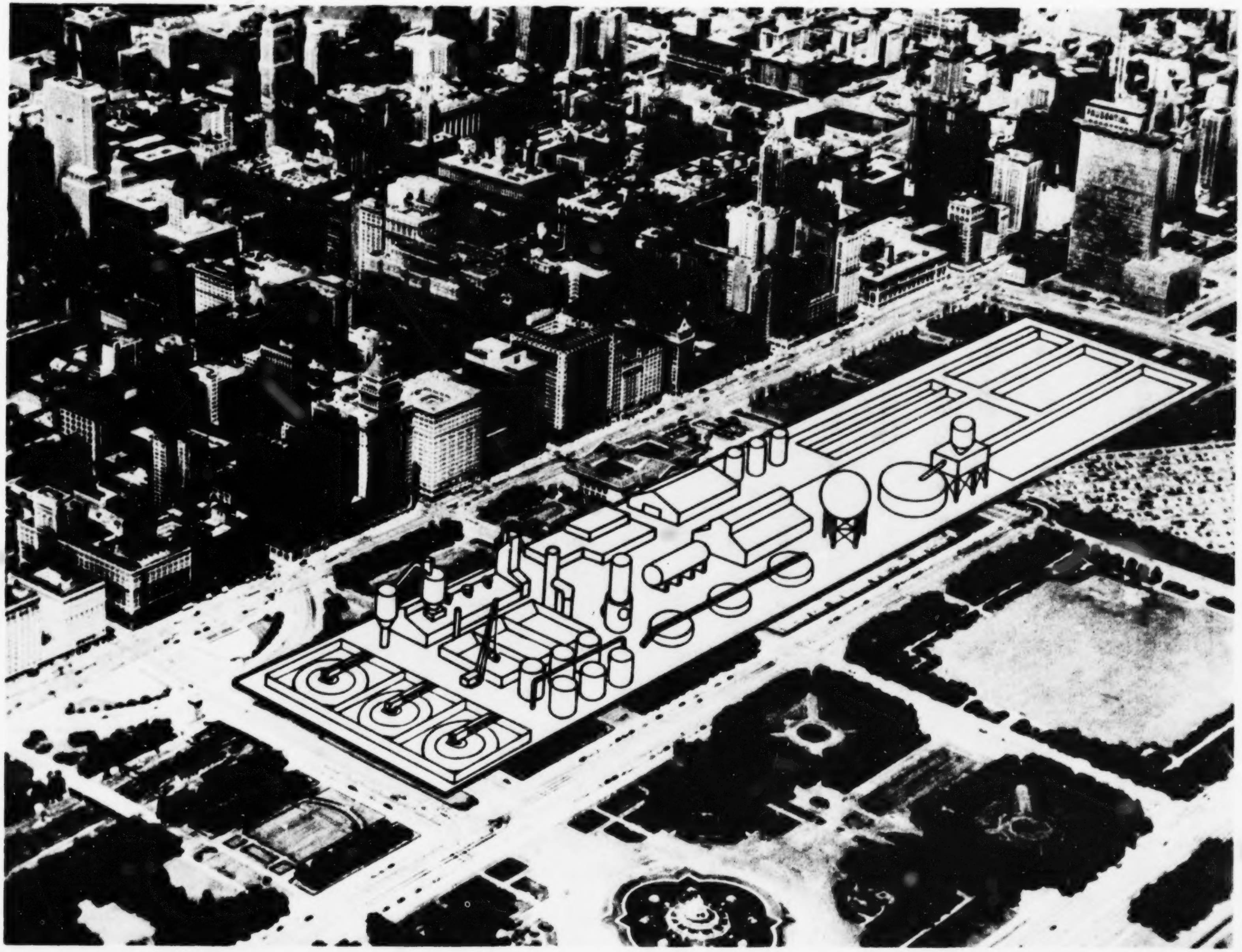
This first slide shows where our complex is located in its relationship to Lake Michigan, which I am sure you are familiar with, and located in the immediate Gary neighborhood are Gary Sheet and Tin, Gary Steel Works, and Gary Tube Works.

As was stated, the American Bridge Division and the Universal Atlas Cement Division's Buffington plant are also within this complex, but are not a part of today's presentation because they have fully met the water quality criteria at an earlier date.

The Grand Calumet River winds approximately nine miles through this area before it can enter Lake Michigan. It may be better depicted on our own map across the way.

To give you an idea of the size of U. S. Steel's undertakings, on this aerial photograph of downtown Chicago we have superimposed all of the waste treatment facilities now constructed at Gary or completed since January 1, 1966. They occupy an area equivalent to 35 acres.

We have been in the business of water quality control since we built the first mill at Gary, and one of our continuing concerns is the installations of new equipment and the expansion of present systems



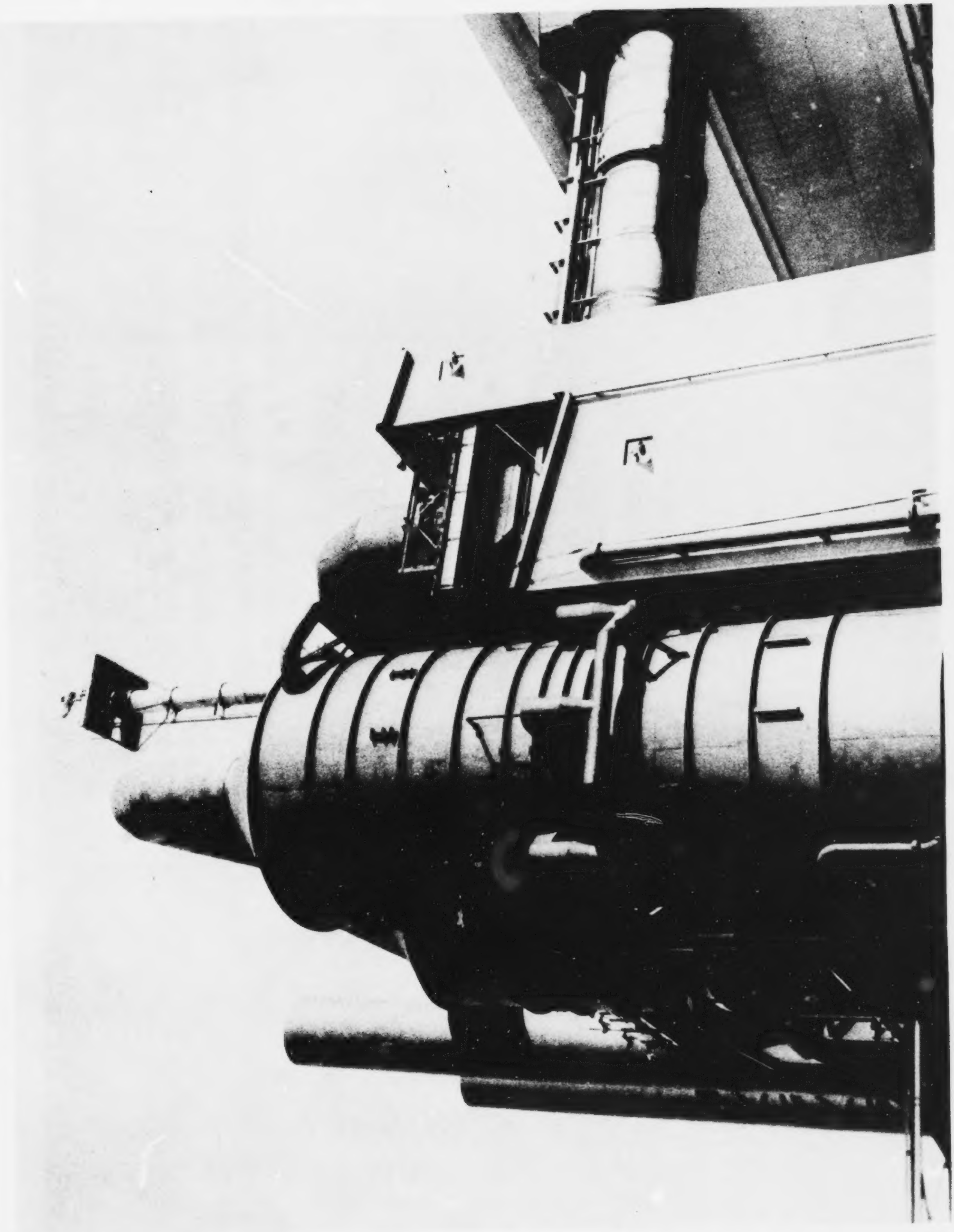
to keep abreast of production advances and increasing standards.

In January of 1966 the basic oxygen shop at Gary Steel Works went into operation. Through a series of sprays and venturi scrubbers, this installation washes out dust from the effluent gases. The towers in the foreground cool the clean gas from the scrubbers and further wash out the dust, and of course this dust has to be removed from the water in clarifiers.

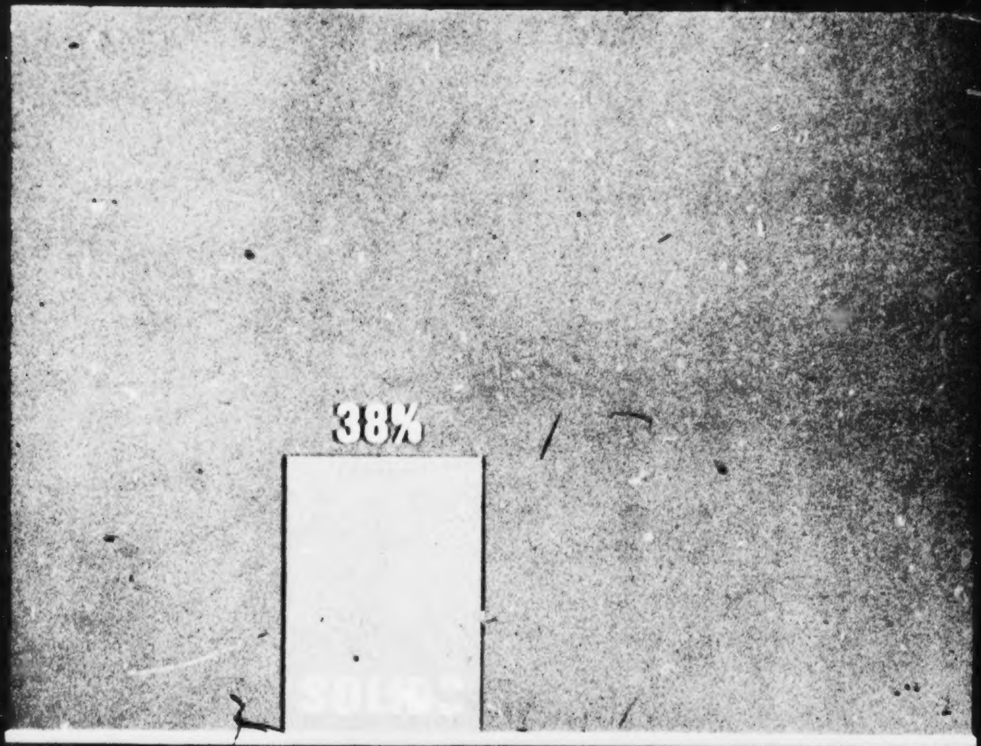
About the same time that this facility went into operation our continuous caster was placed into operation. These two facilities accomplished 38 percent of the goal for removing solids and oil removal. Hereafter, each of the percentages mentioned will be in terms of percentage of our total objective for the Gary Steel Works. There is literally no oil removal in these facilities shown. They are a very small amount.

The terminal treatment works of the Gary Sheet and Tin Works started operation in July 1967. It removes wastes consisting of emulsified cold rolling oils and suspended solids. And this clear water is our final product.

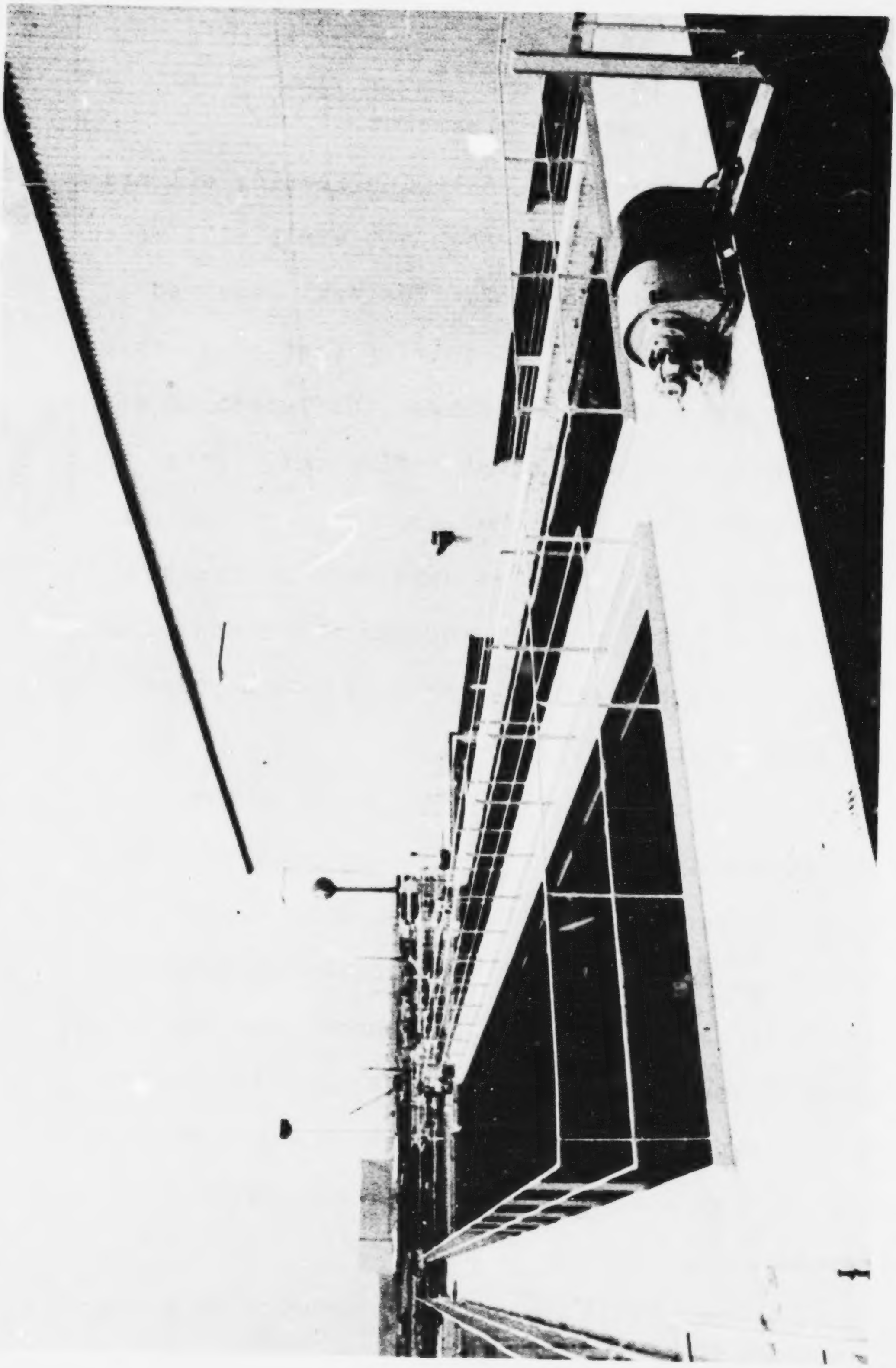
This installation advanced oil removal



USS STEEL WORKS
Basic Oxygen Plant
January 1966



Additions to Water Conservation Systems Since January 1966
Percent Waste Removal Objective



28 percent and solids removal 2 percent.

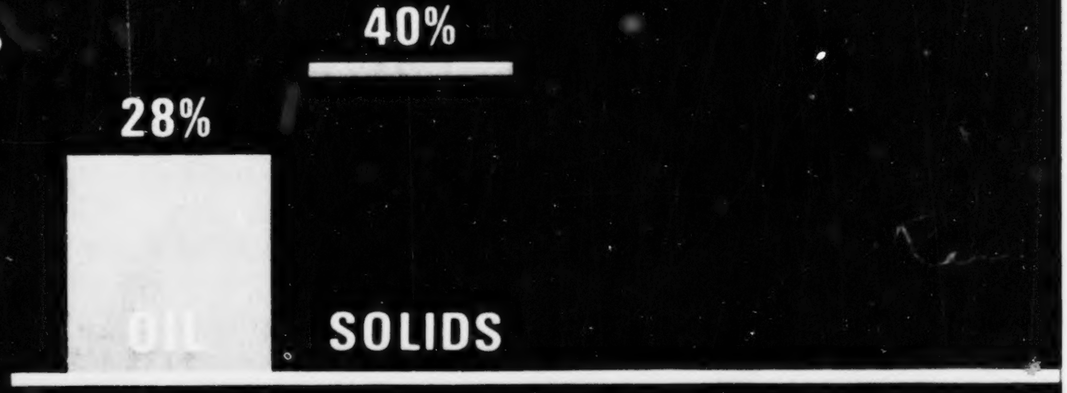
Mill scale and waste lubricating oil are problems for control in the 84-inch hot strip mill which went into operation late in 1967. The mill required construction of facilities, not only of vast size--this settling basin being about two-thirds the length of a football field--but also of great refinement. This filter which traps particles smaller than a micron is similar to the filtration system used in clarification of drinking water. Recovery of the waste oil and solids by these facilities advanced our progress 40 percent and 69 percent, respectively.

Two months after completion of the 84-inch mill, work was finished on a disposal well for waste pickle liquor. The well reaches down 4,300 feet into the ground, into the Mount Simon sandstone formation. This porous rock, which I have here and which I will give to you in a minute, will absorb 14 percent of its volume and permanently isolates this waste material from the potable ground water and surface water systems.

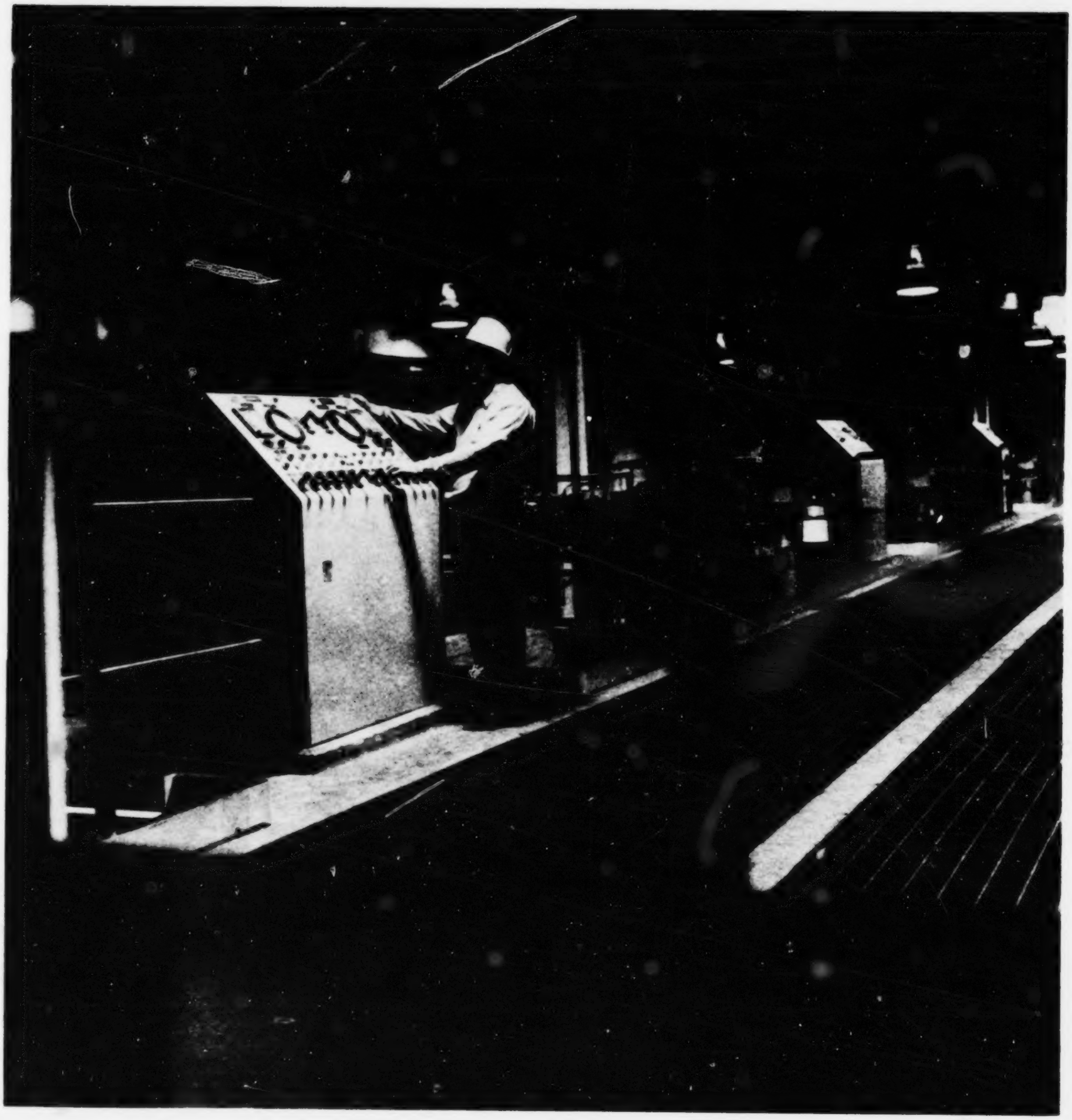
The installation is equipped with a complex array of electronic control equipment, a portion

USS SHEET & TIN WORKS

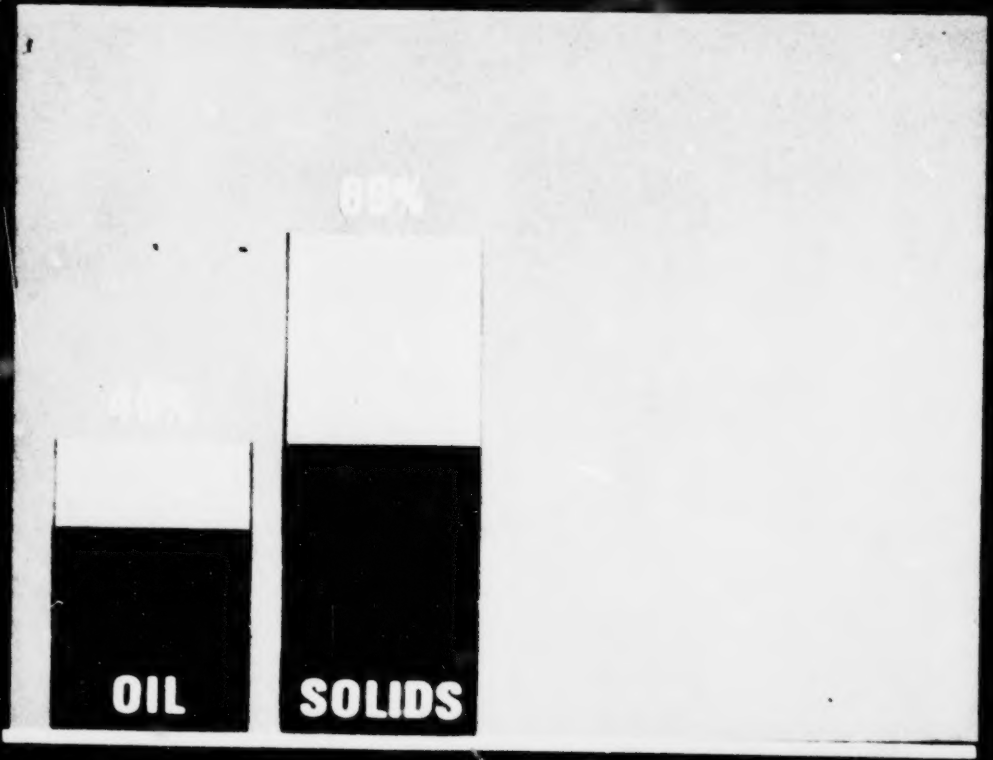
Terminal Treatment Plant
July 1967



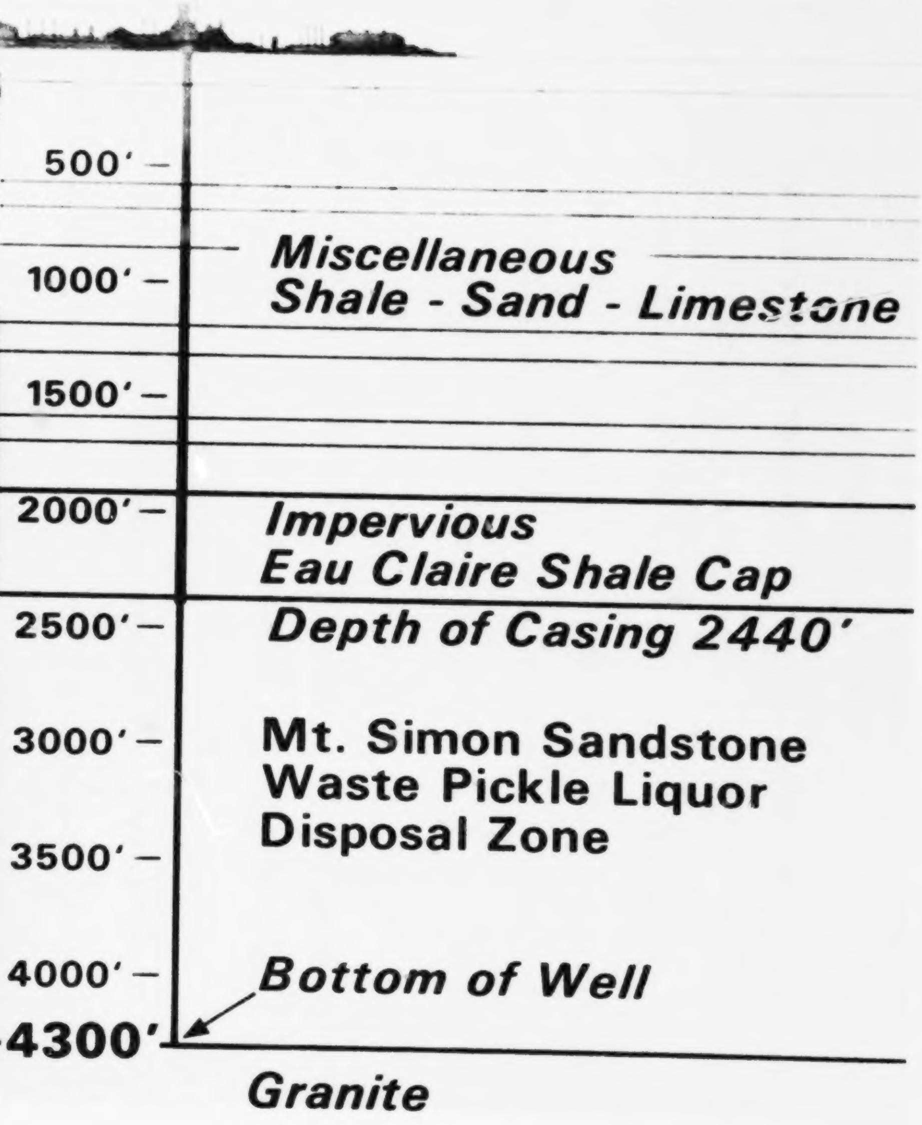
Additions to Water Conservation Systems Since January 1966
Percent Waste Removal Objective



USS SHEET & TIN WORKS
84'' Hot Strip Mill
September 1967



Additions to Water Conservation Systems Since January 1966
Percent Waste Removal Objective



500′ –

1000′ –

1500′ –

2000′ –

2500′ –

3000′ –

3500′ –

4000′ –

4300′

Miscellaneous
Shale - Sand - Limestone

Impervious
Eau Claire Shale Cap

Depth of Casing 2440′

Mt. Simon Sandstone
Waste Pickle Liquor
Disposal Zone

Bottom of Well

Granite

of them shown here, to assure proper performance.

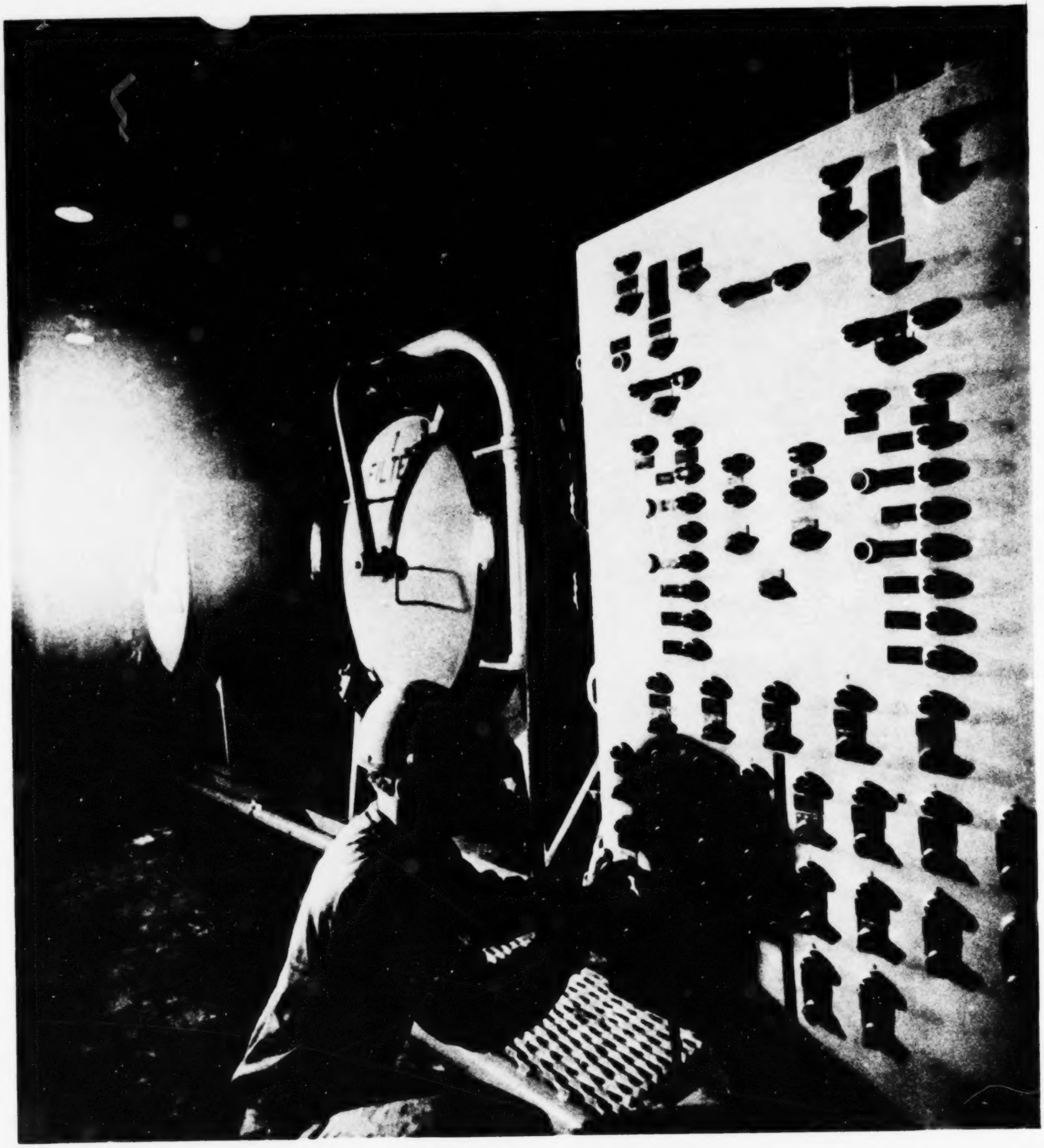
Just as an example of some of the delays that are encountered, over six months were lost in installing electrical control panels for this system.

The well accomplishes 90 percent of the pickle waste disposal correction.

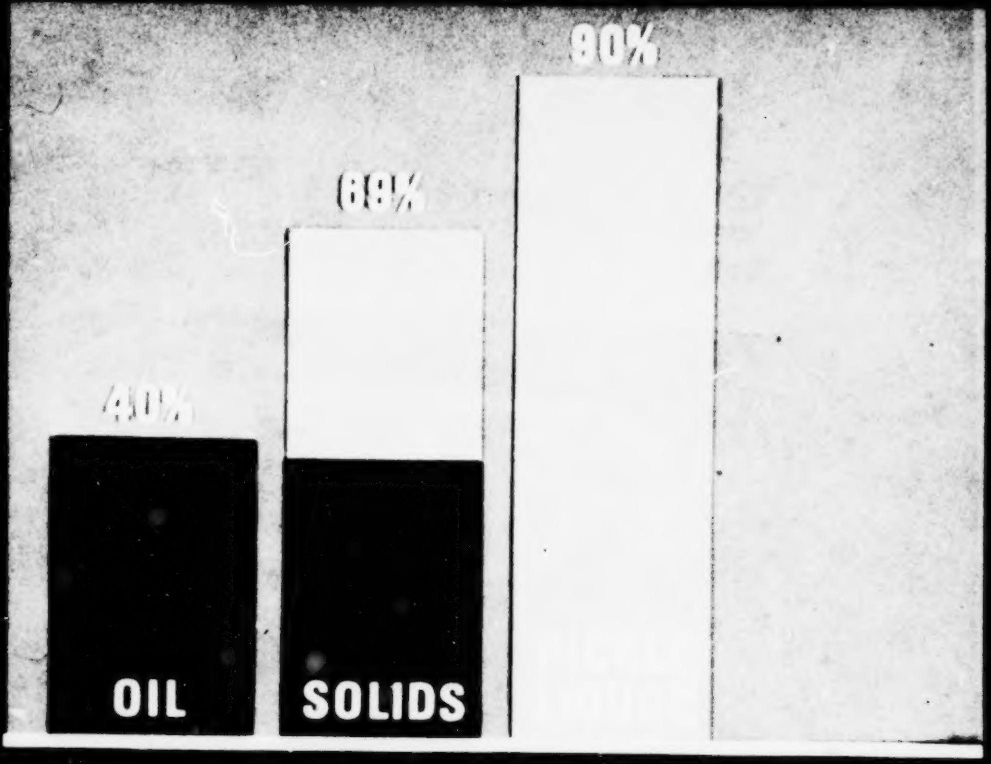
A waste acid neutralization treatment plant treats the remaining acid and caustic wastes from the number 5 and the number 6 tinning lines and waste acid from the stainless steel pickling line. When this treatment plant was placed into operation in the fall of 1967, an additional five percent of the acid wastes was treated.

The remaining five percent of the pickling wastes received treatment when the Gary Tube Works completed this collection system in July 1968. From the storage tank the waste is hauled to the disposal well. This completed the facilities for the treatment of pickling wastes, 100 percent attainment of the objective.

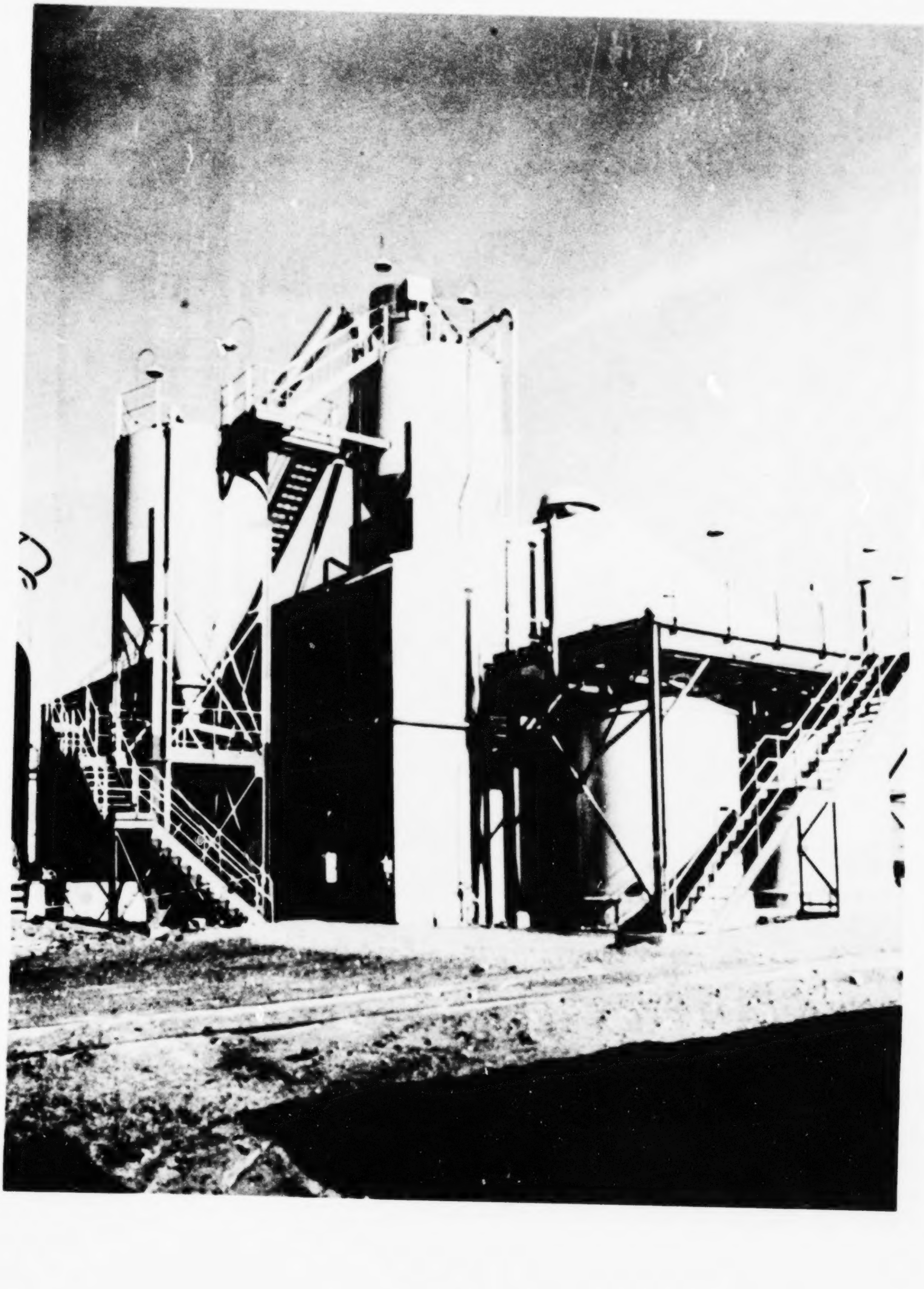
On July 1, 1968, rinse water from the 66-inch pickle line and the 84-inch pickle line and waste from the 80-inch cold reduction mill and waste from the west 5-stand cold reduction tin mill treatment plant



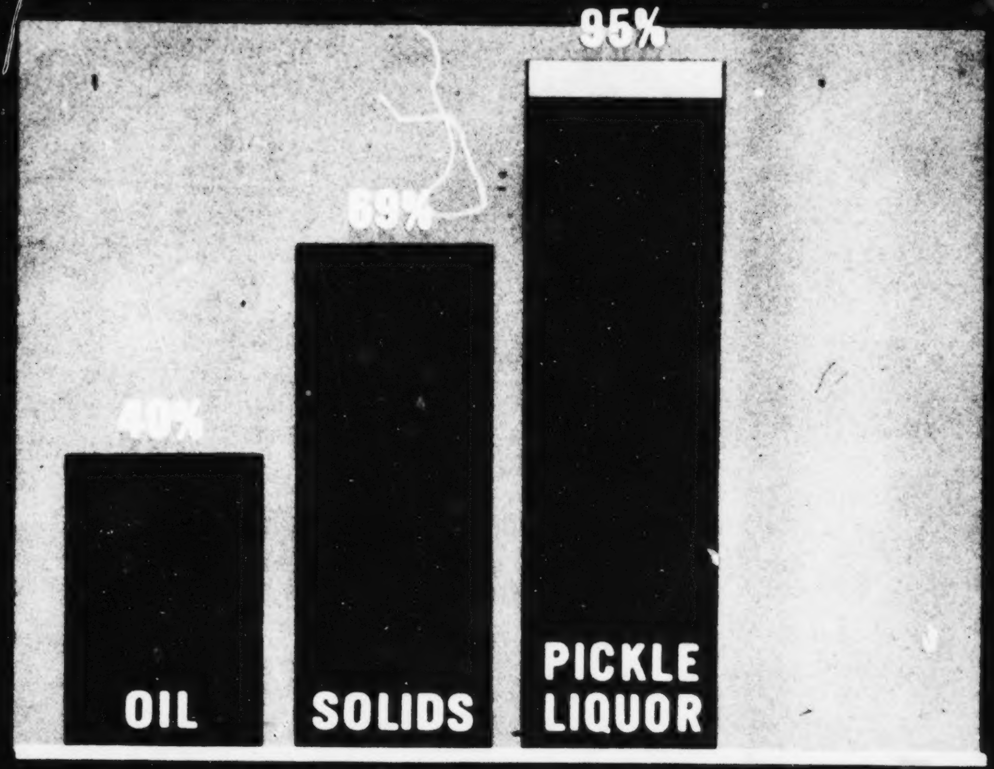
USS SHEET & TIN WORKS
Deep Well
September 1967



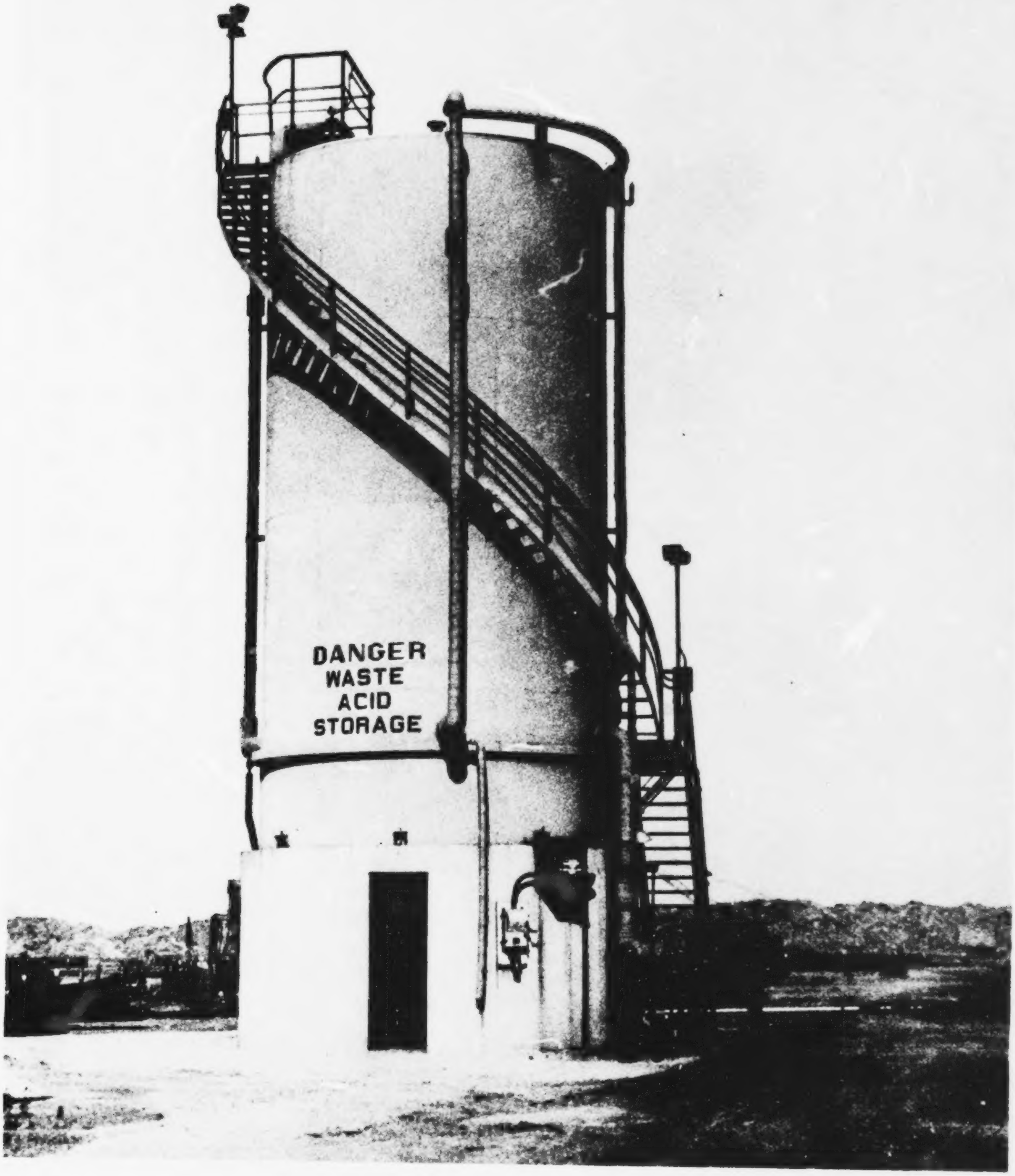
Additions to Water Conservation Systems Since January 1966
Percent Waste Removal Objective



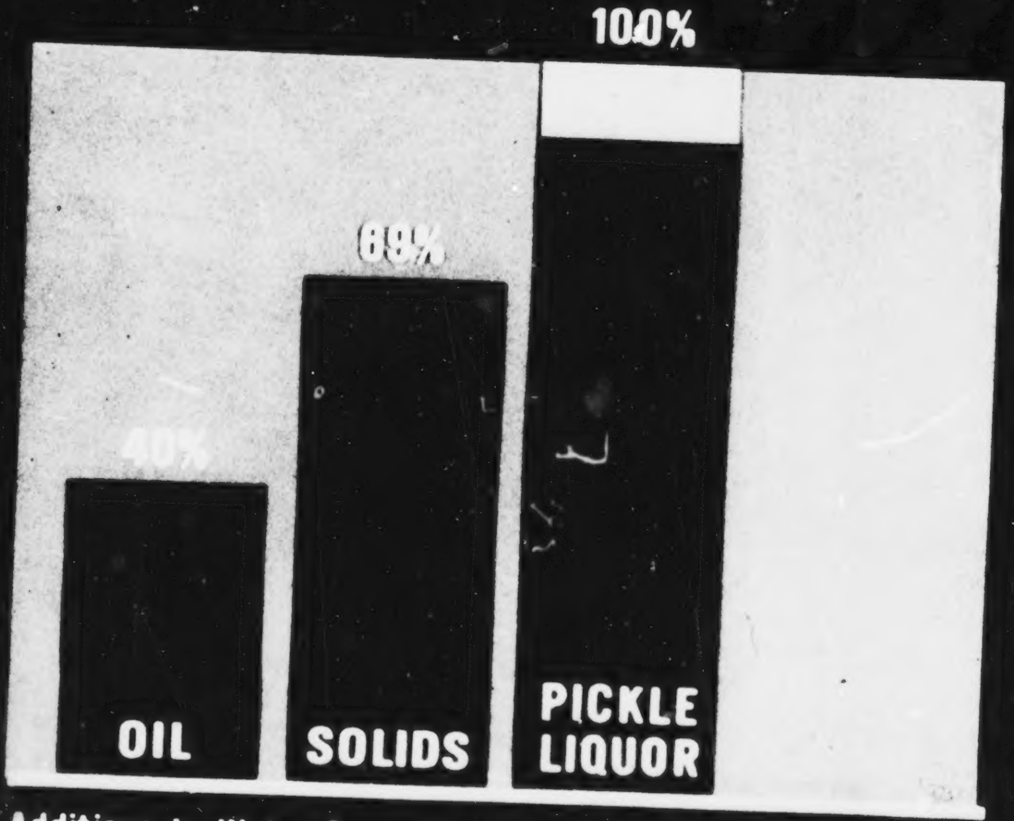
USS SHEET & TIN WORKS
Neutralization Plant
December 1967



Additions to Water Conservation Systems Since January 1966
Percent Waste Removal Objective


DANGER
WASTE
ACID
STORAGE

USS TUBE WORKS
Pickle Liquor Disposal
July 1968



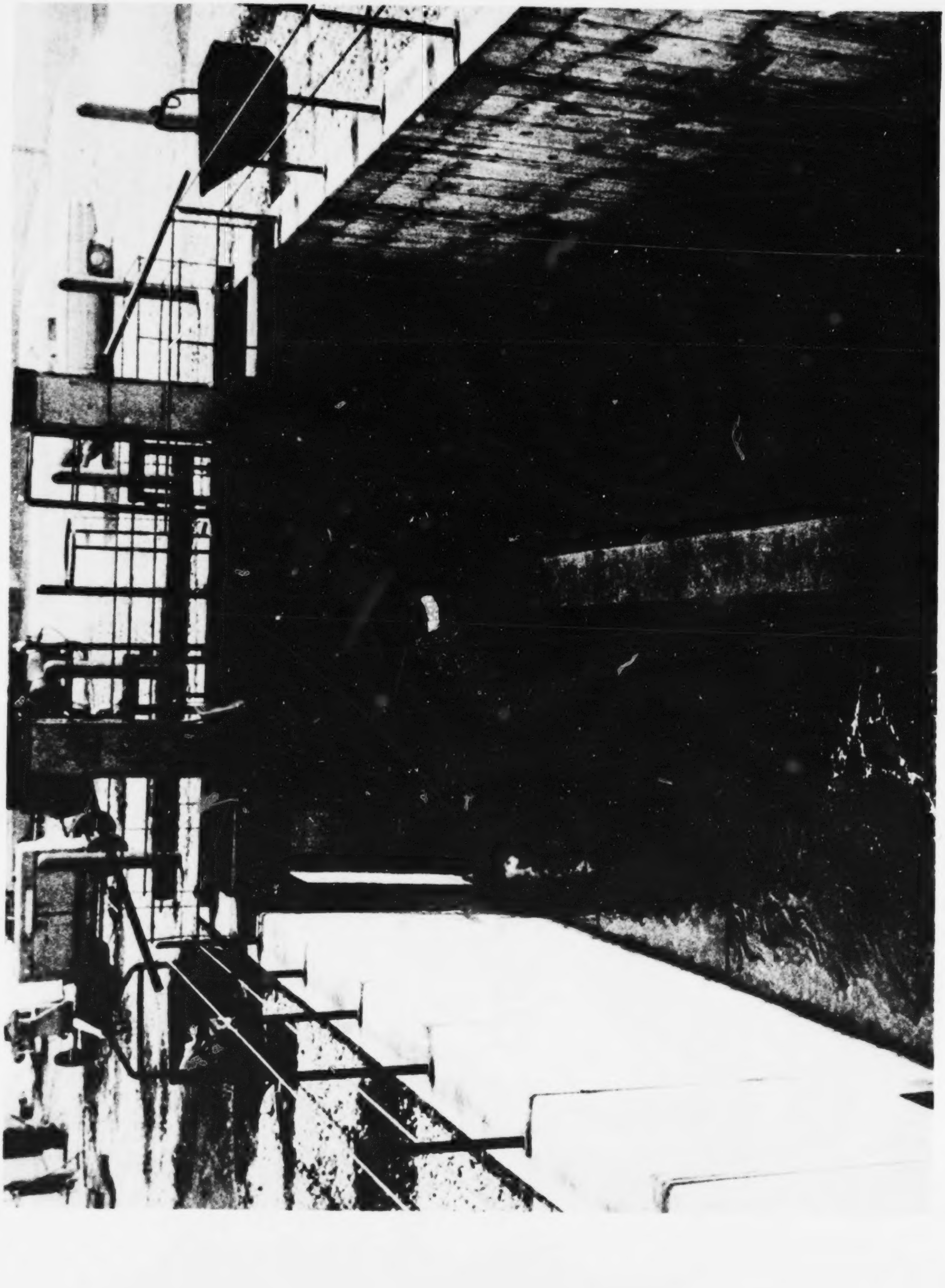
Additions to Water Conservation Systems Since January 1966
Percent Waste Removal Objective

were rerouted to the terminal treatment plant. In this last case it means that we are treating the waste twice, because the first plant did not do a good enough job.

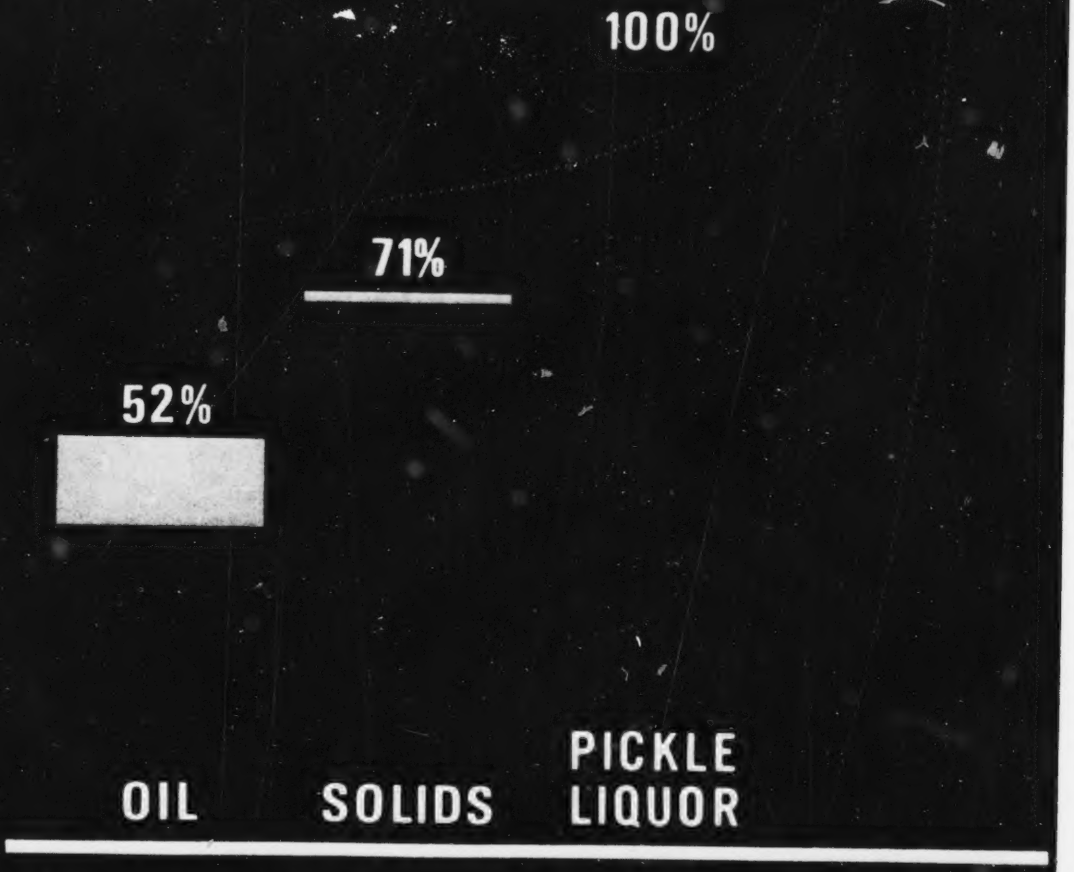
On August 1, 1968, work was finished on a two-compartment scale pit equipped with dragout cleaning facilities and oil skimmers for the seamless pipe mill at Gary Tube Works which was reported by Mr. Miller. These changes and facilities account for a 12 percent gain in oil removal and a 2 percent improvement in solids removal.

In November 1968 the Gary Tube Works terminal waste treatment facility was placed in operation. This facility consists of a three-compartment scale pit with dragout scrapers, and removes mill scale and has skimmers which remove the oil,which is the final treatment for the Gary Tube Works. This was placed into operation just a few days ago and is not entirely completed yet but it is operable. This advanced the oil removal 6 percent and the solids recovery 1 percent.

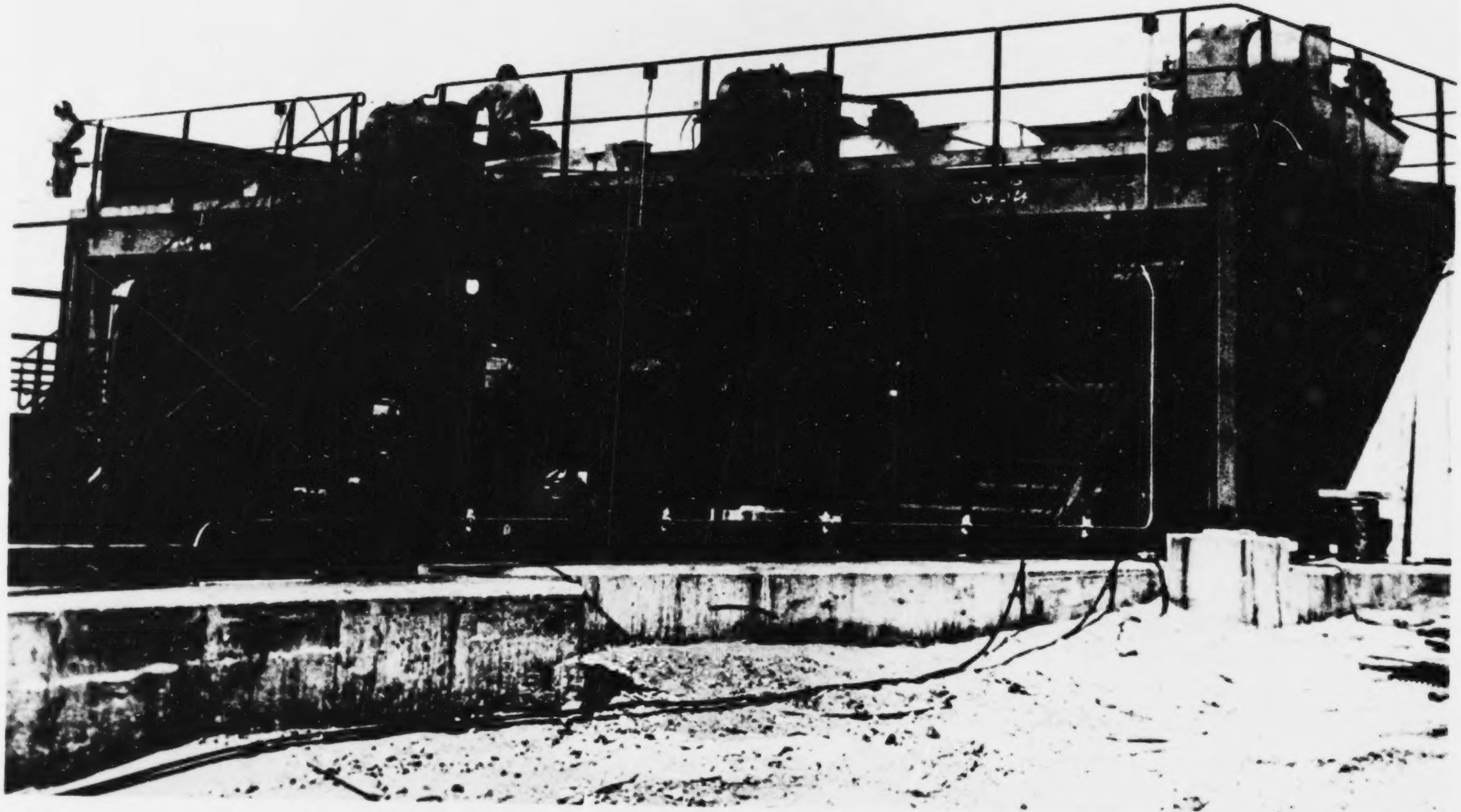
Substantial improvement in solids removal is under way at the Gary blast furnace area. Formerly, flue dust was trapped in four large settling basins.



USS TUBE WORKS
Seamless Mill
August 1968



Additions to Water Conservation Systems Since January 1966
Percent Waste Removal Objective



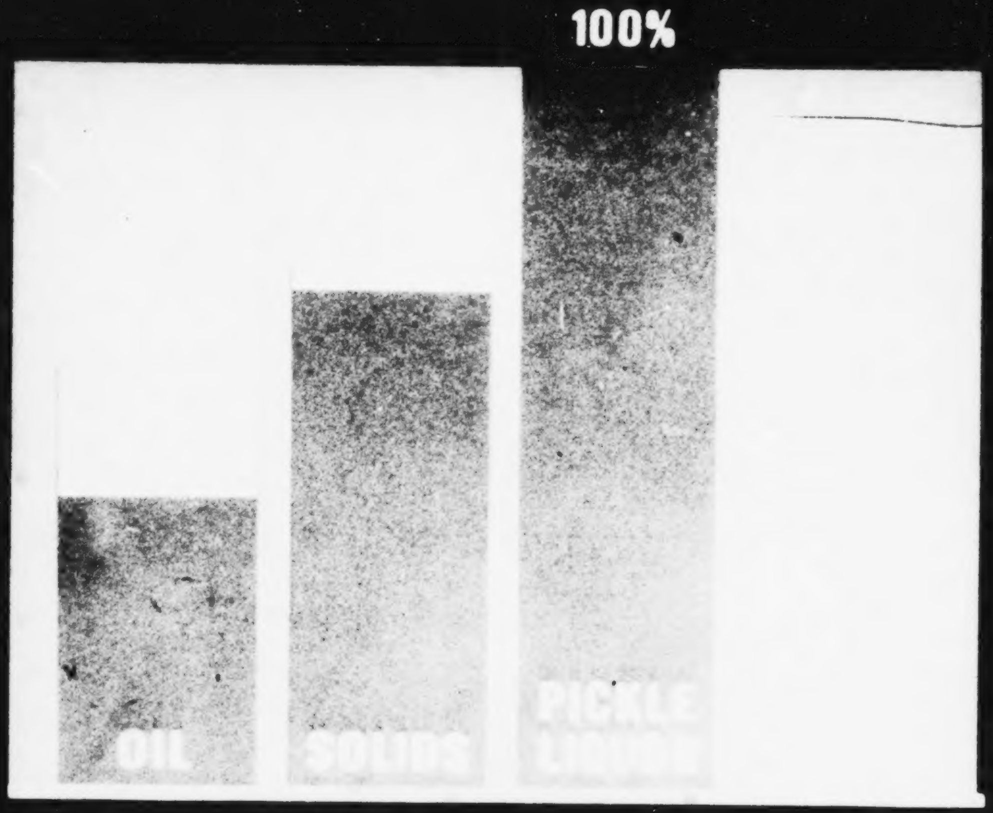
These settling basins have been enlarged to increase their capacity 30 percent, and when they are placed into operation this month, solids removal will be increased 15 percent. The treatment of Gary Steel Works coke plant wastes offers an excellent illustration of plant-community cooperation in solving a waste treatment problem. This month these storage facilities, along with a mile and a half of in-plant piping, will begin collecting the Gary coke plant wastes for treatment in the municipal sewage plant. The coking wastes will be rerouted, along with the plant sanitary wastes, to the municipal treatment plant.

Now in December 1968,100 percent control of the waste pickle liquor has been accomplished along with 100 percent control of the coke plant wastes and 88 percent of the solid wastes; with an additional oil recovery of 4 percent resulting from the coke plant and the blast furnace flue dust system, the percentage of oil removal has now raised to 62 percent.

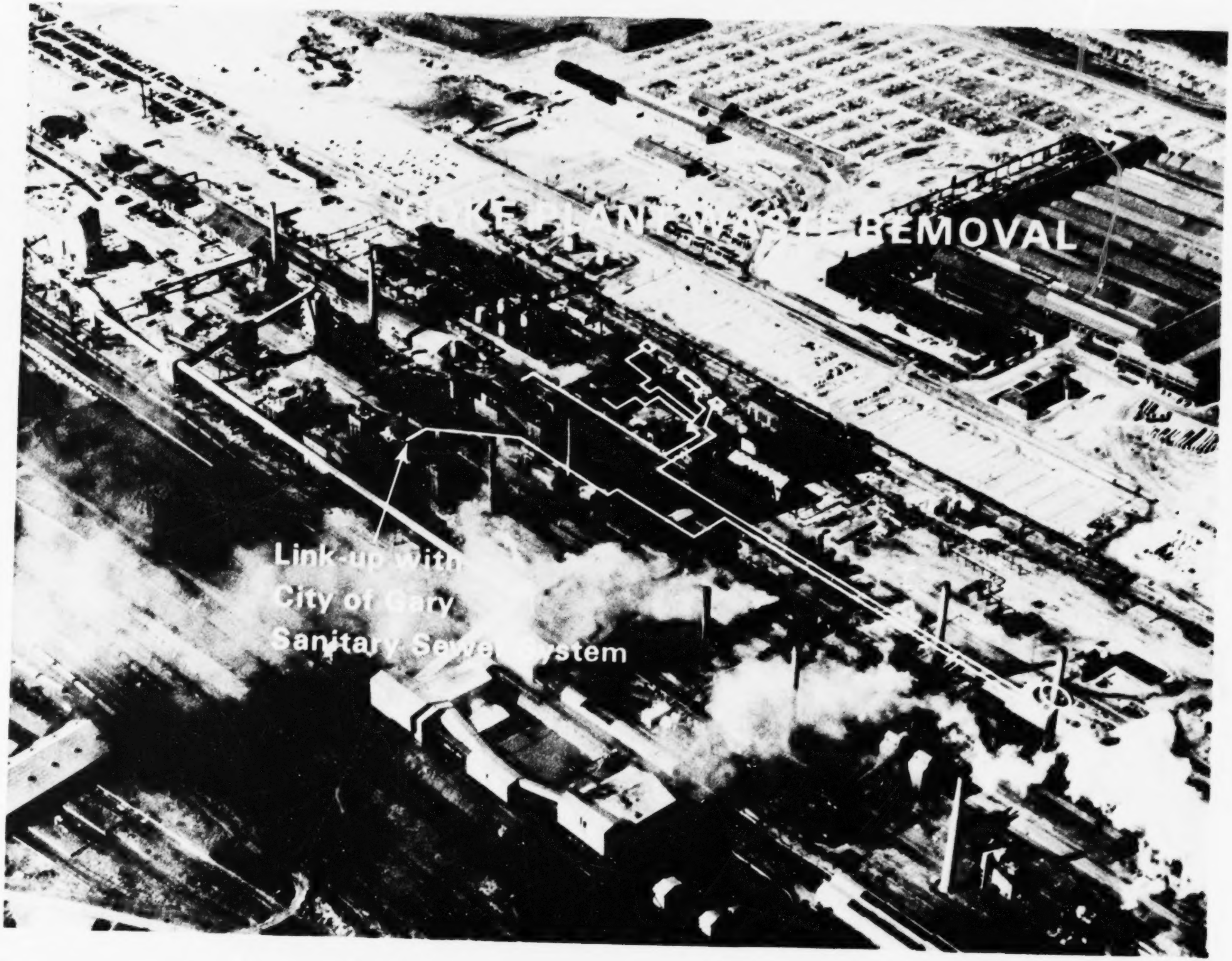
This brings the waste discharges from U. S. Steel's Gary facilities into compliance with the water quality criteria for Lake Michigan at the monitoring points adopted by the Federal Conference in 1966.

USS TUBE WORKS

Terminal Waste Treatment
November 1968

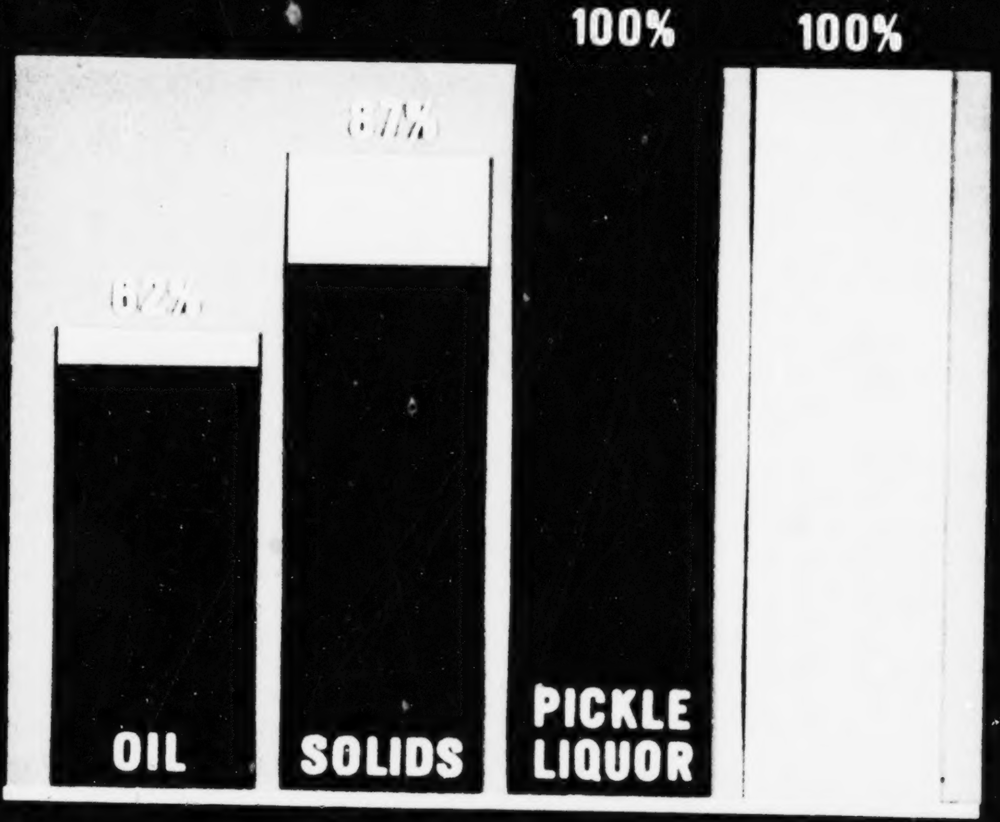


Additions to Water Conservation Systems Since January 1966
Percent Waste Removal Objective


COKE PLANT WASTE REMOVAL
Link-up with
City of Gary
Sanitary Sewer System

USS STEEL WORKS

Coke Plant and
Blast Furnaces
December 1968



Additions to Water Conservation Systems Since January 1966
Percent Waste Removal Objective

The remaining U. S. Steel water quality improvement program will bring the waste discharges from the Gary facilities into compliance by March of 1970 with the water quality improvement program and effluent criteria adopted by the Indiana Stream Pollution Control Board and approved by the Federal Water Pollution Control.

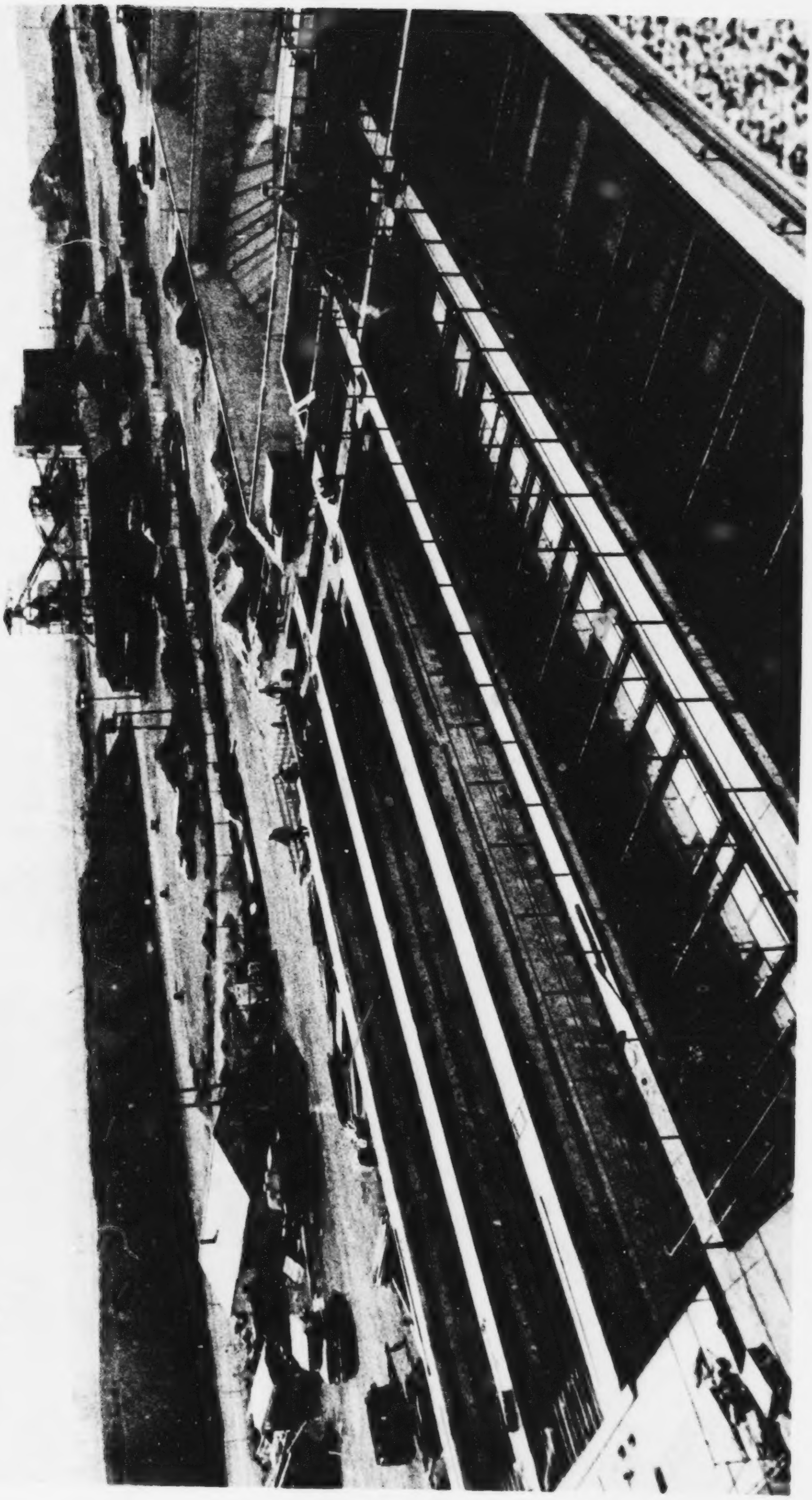
MR. STEIN: Did you change that date from July to March there?

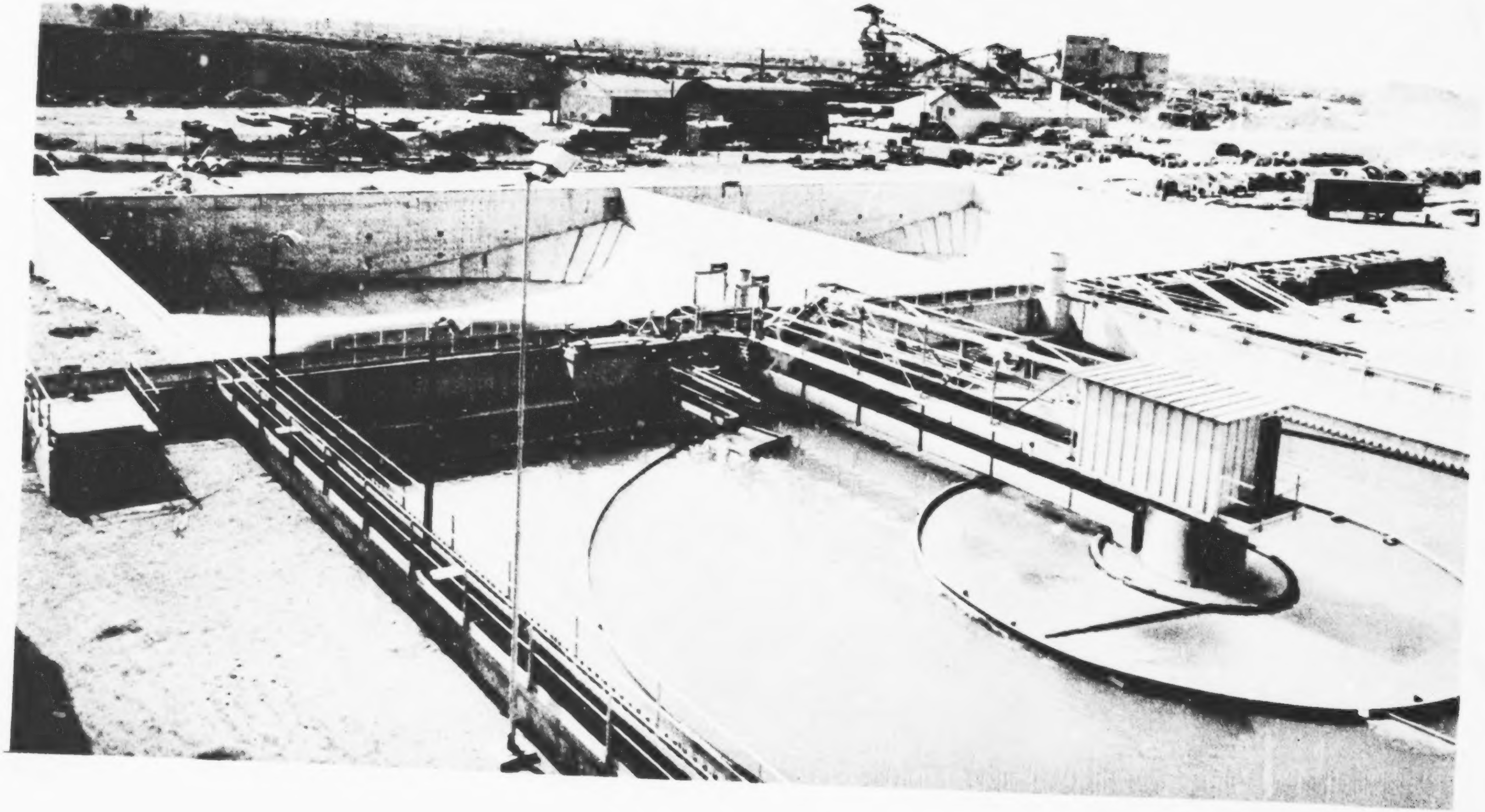
MR. DUNSMORE: Yes, that was originally March and I had it July because I thought it was in error, and when I got here I found that March was the correct figure.

MR. STEIN: All right. Thank you.

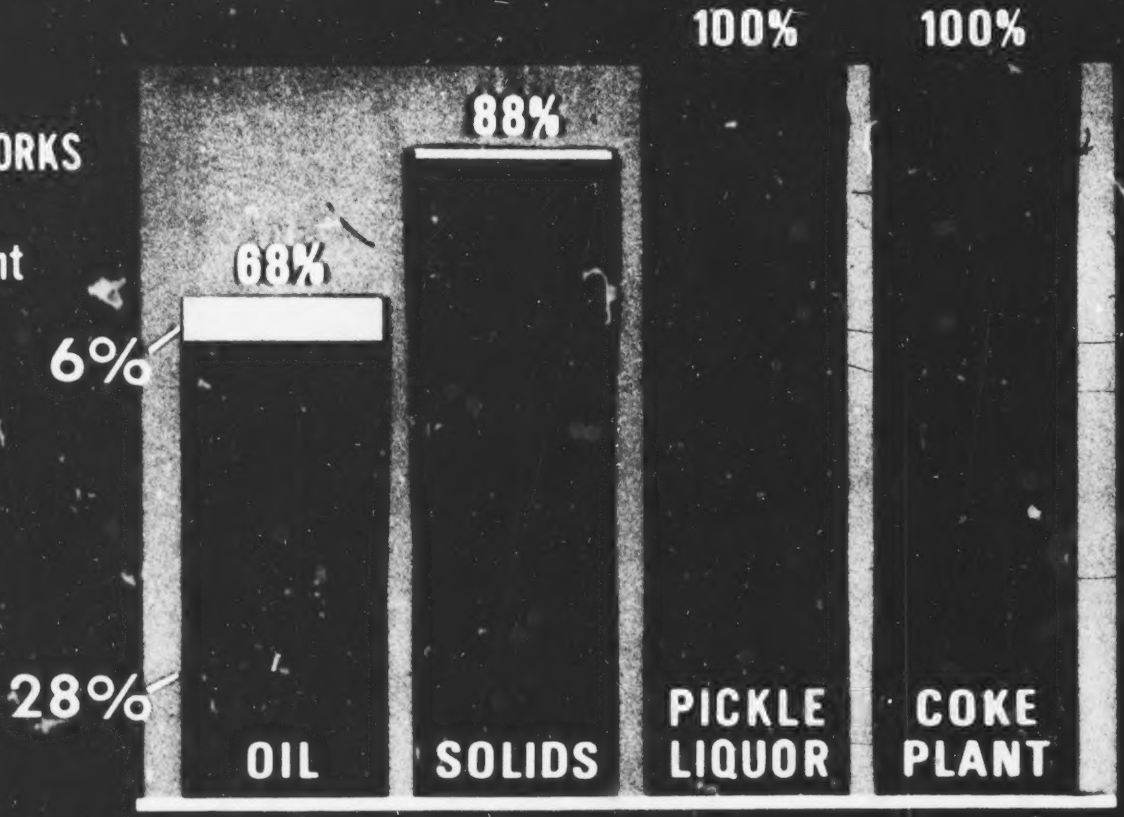
MR. DUNSMORE: The next advance will be accomplished on July 1, 1969, when the additions to the terminal treatment plant are placed into operation.

The law of diminishing returns come into play when one realizes that three primary settling basins are needed to be added to the present two, and these two flocculator-clarifiers to the present one. When this is done, they will achieve only a 6 percent gain in oil recovery and some solids removal, compared to the first installation's 28 percent advance in oil removal.





USS SHEET & TIN WORKS
Expanded
Terminal Treatment
July 1969



Additions to Water Conservation Systems Since January 1966
Percent Waste Removal Objective

H. J. Dunsmore

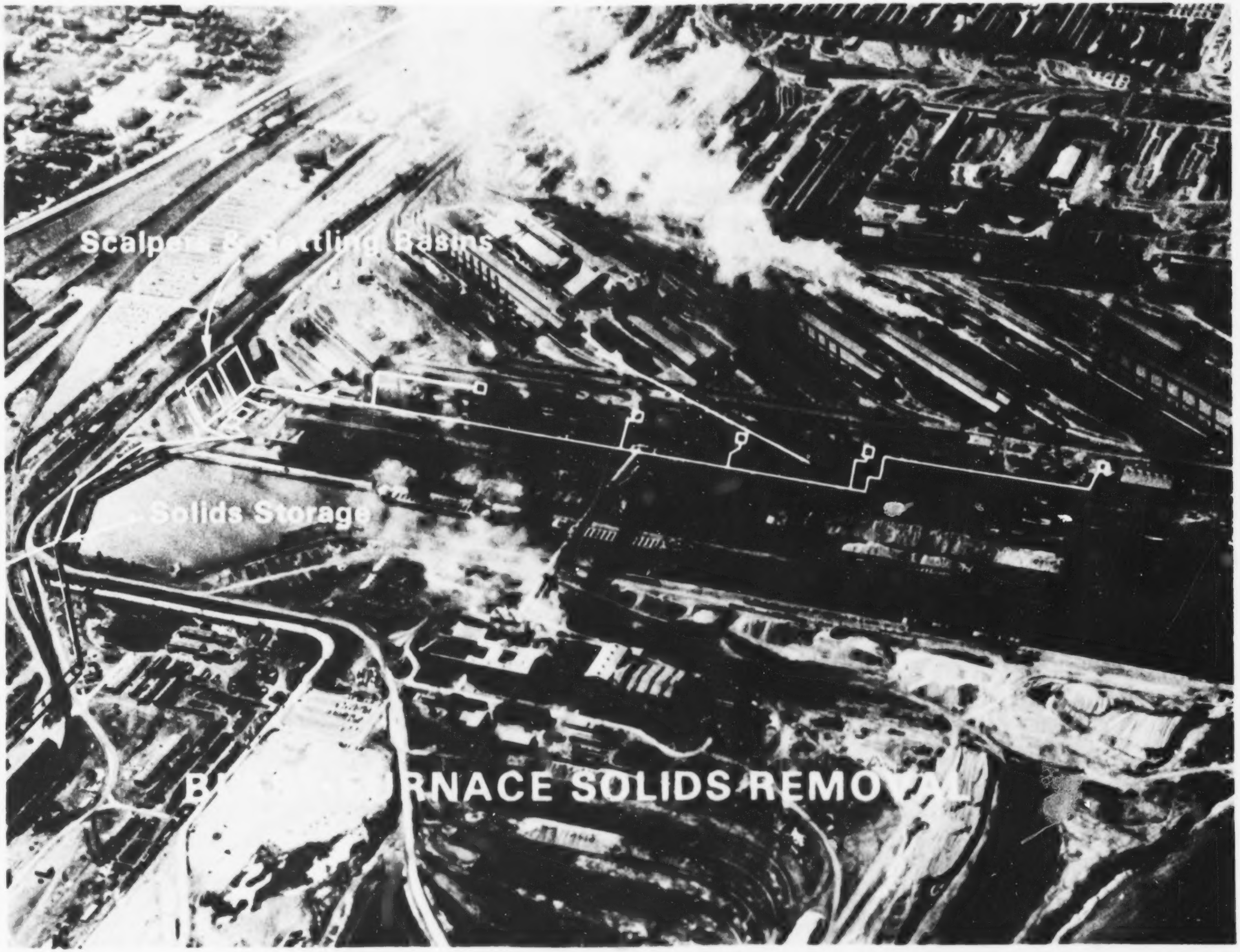
To aid further in maintaining the high performance at the settling basins of the Gary blast furnace area, two scalper-clarifiers 80 feet in diameter are being installed to trap the heavier dust particles before they can reach these basins. When completed and placed in operation a year from now, this will advance solids removal six percent.

The Gary rolling mills have always had scale pits. In some instances their capacity is exceeded by present production demands. Many of these generate considerable amounts of waste lubricating oil not readily retained in scale pits.

To improve the mill recovery, we are constructing three settling basins, each 200 feet by 700 feet, as shown in this photograph, and each will be equipped with two floating drum skimmers.

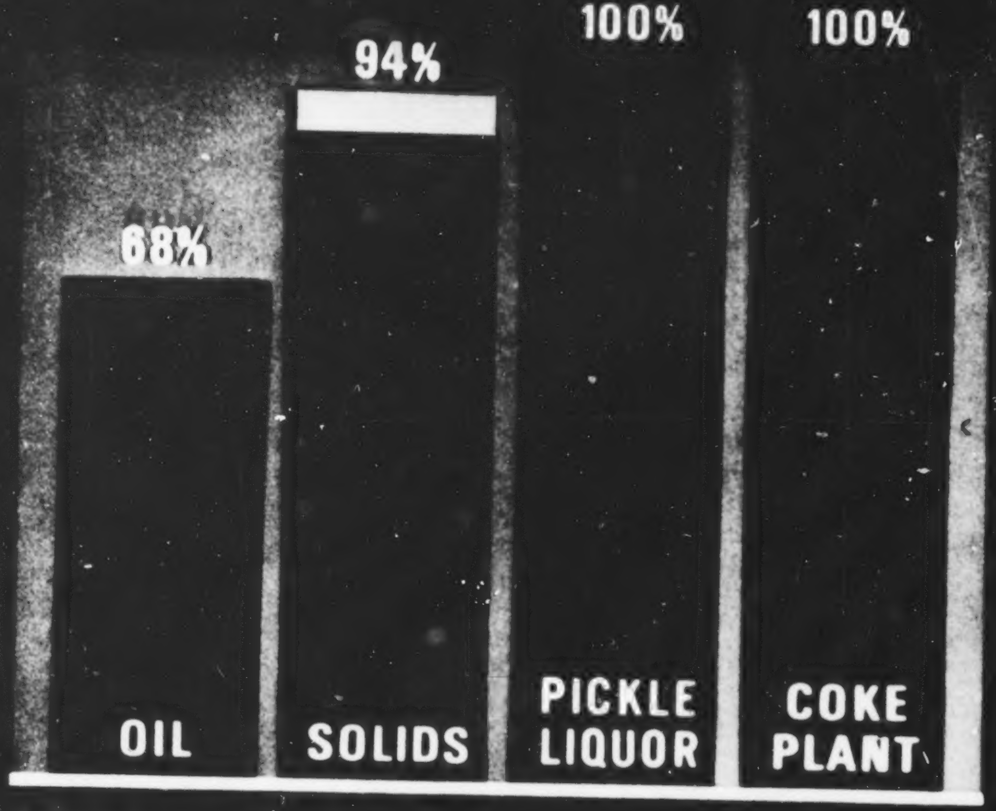
When the settling basins and the supporting facilities are completed about January 1, 1970, they will advance solids removal four percent and oil removal nineteen percent.

Provision of further treatment for the full flow from the 80-inch hot strip mill is the final step in Gary's program. It will be accomplished through

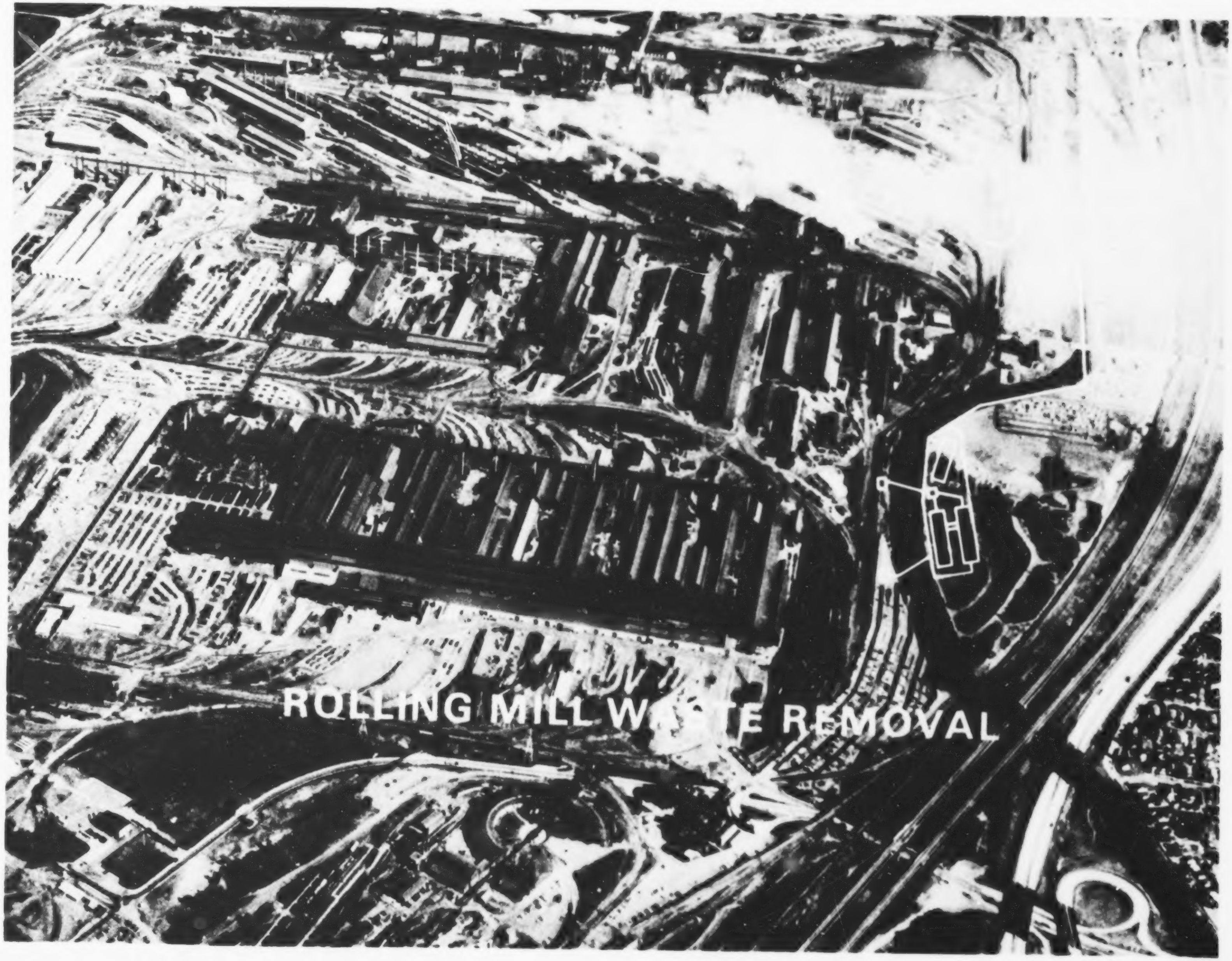

Scalpers & Settling Basins
Solids Storage
B RNACE SOLIDS REMOVAL

USS STEEL WORKS

Flue Dust Scalper
December 1969

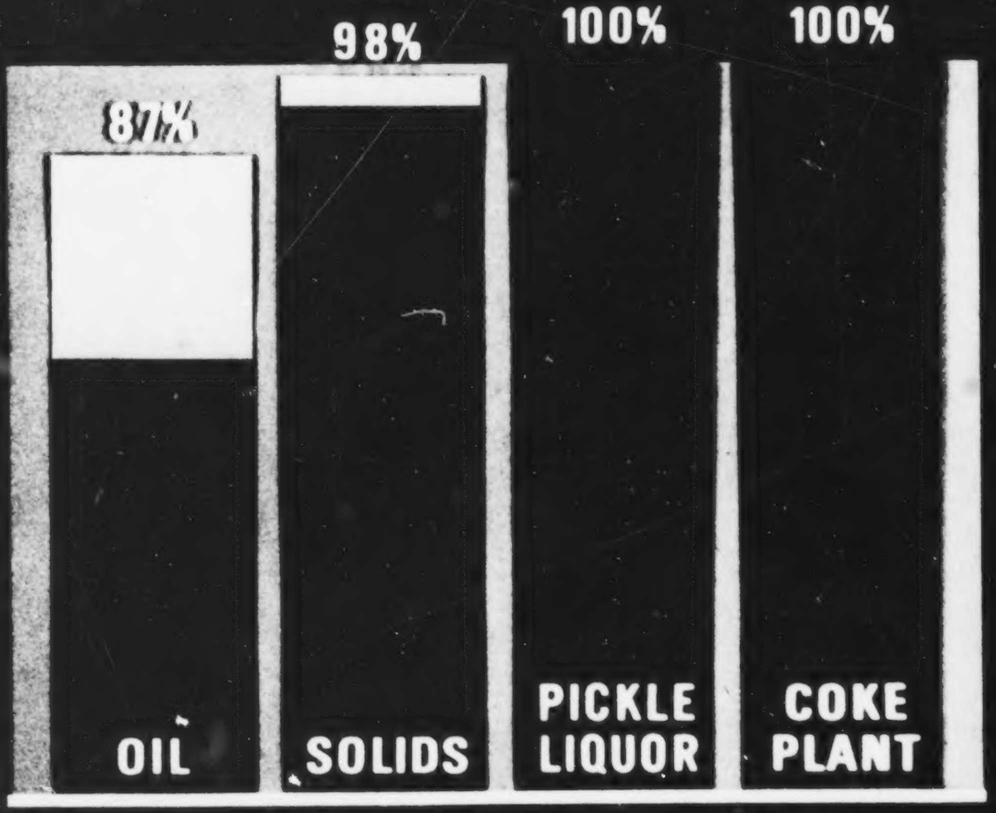


Additions to Water Conservation Systems Since January 1966
Percent Waste Removal Objective


ROLLING MILL WASTE REMOVAL

STEEL WORKS

Settling Basins
January 1970



Additions to Water Conservation Systems Since January 1966
Percent Waste Removal Objective

further settling in these pits, originally designed to accommodate this additional flow, and high rate filtration which may require expansion of the present filtration plant.

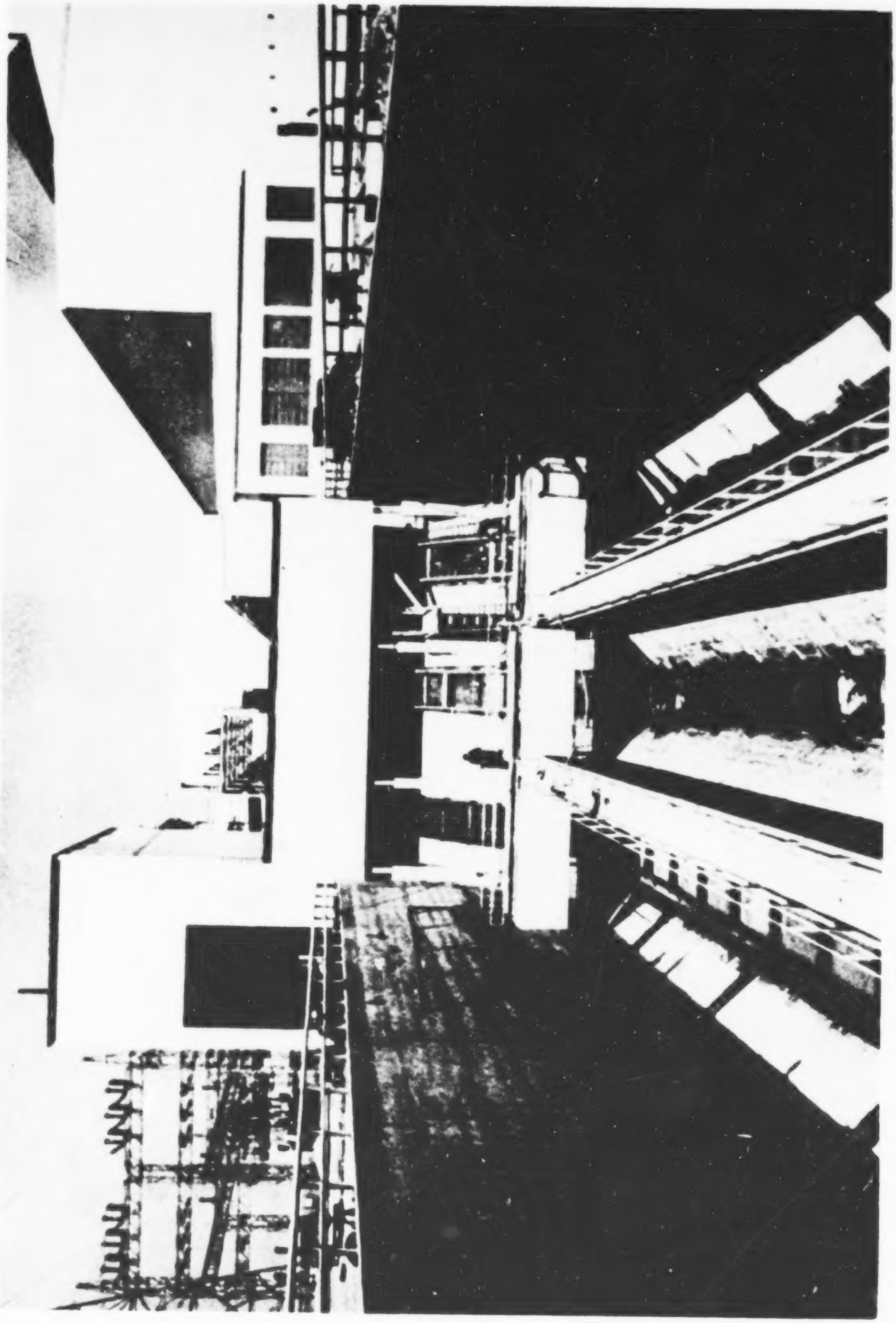
Completion of these facilities will bring the treatment of oil and solid wastes to 100 percent by March 1970.

In U. S. Steel's modern laboratory, located at Gary Steel Works, extensive analyses are performed on representative samples taken from each of the outfalls from the total Gary complex and transmitted to the State Department monthly. This is done to verify the reliability of the treatment process.

Here are three separate photos of various facilities within the lab, including a spectograph and other complex equipment.

In summary, we have shown you the facilities we have completed to date and their impact on the Conference objective. Construction is underway on all the remaining waste treatment facilities except the 80-inch hot strip mill, for which engineering is just being completed.

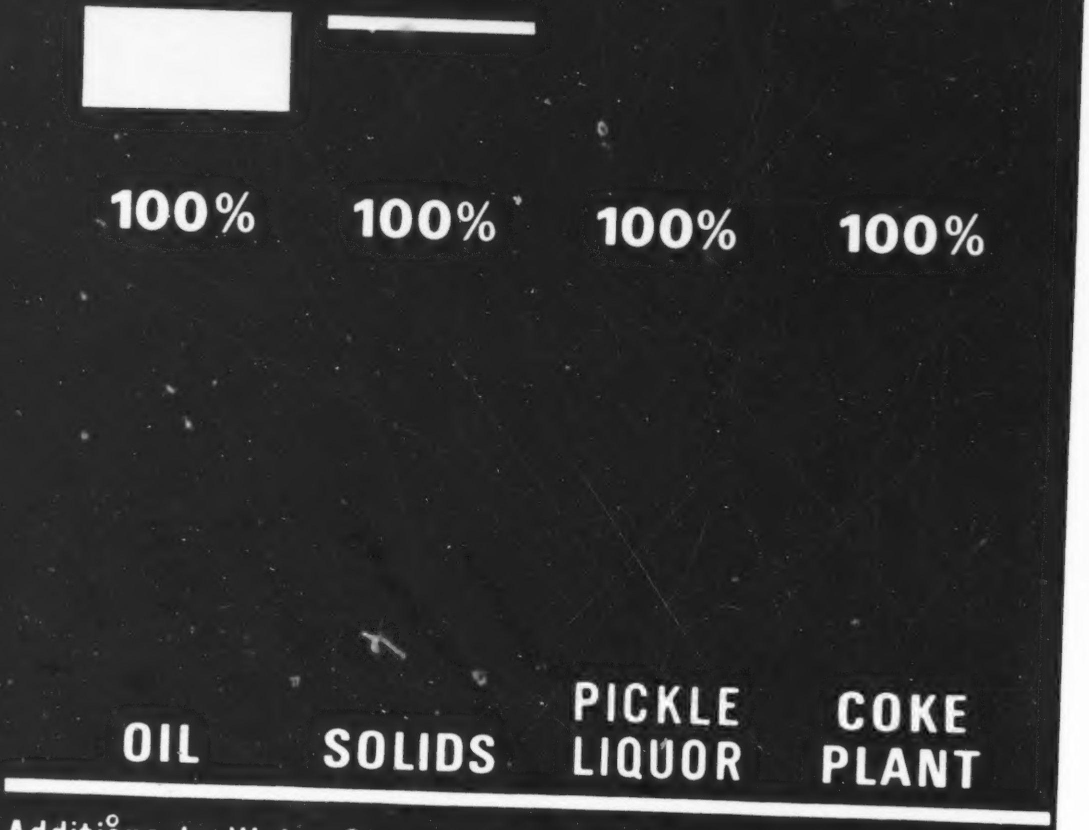
The facilities scarcely convey the



SHEET & TIN WORKS

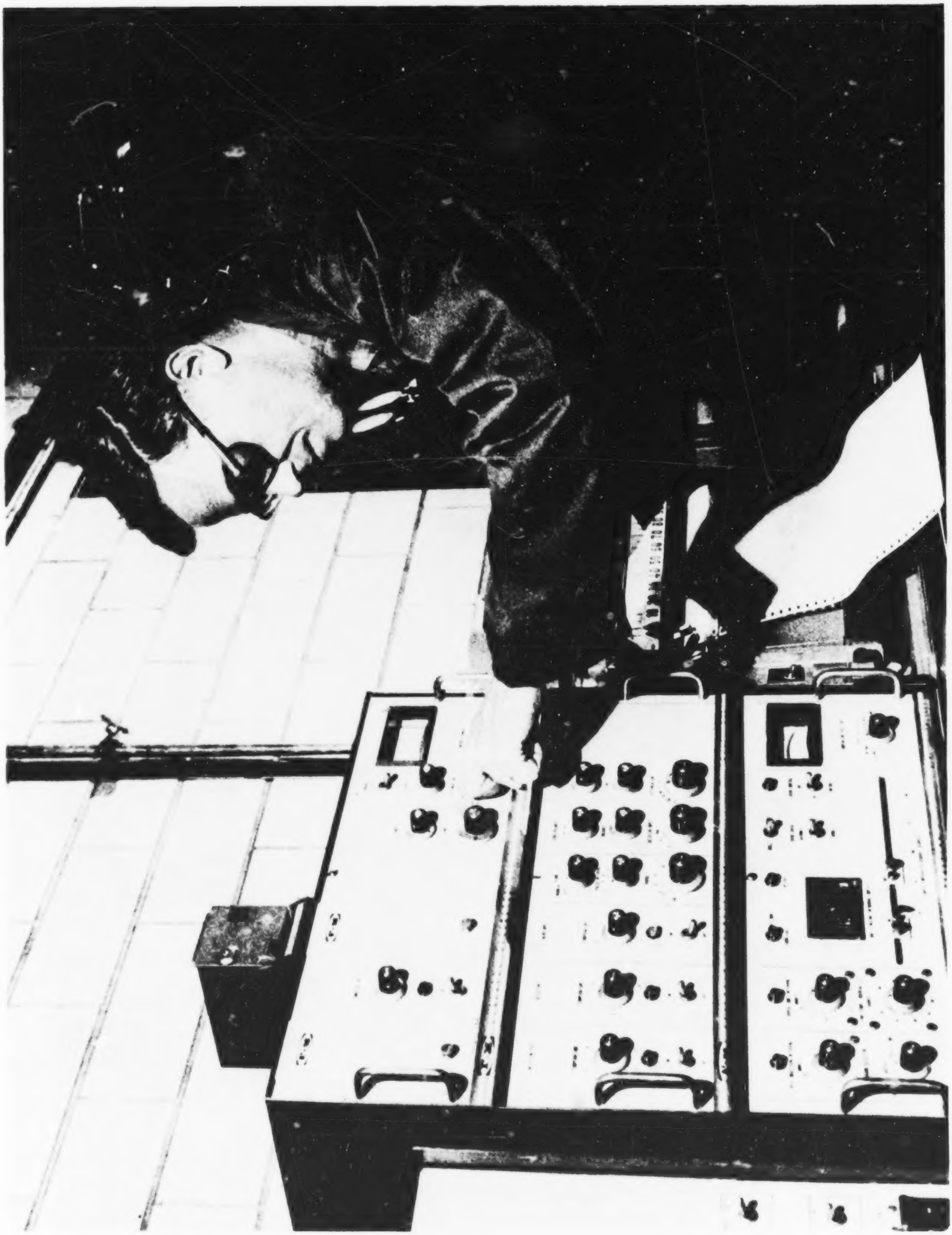
80'' Hot Strip Mill

July 1970



Additions to Water Conservation Systems Since January 1966

Percent Waste Removal Objective



monumental task involved. For example, engineers labored more than 200,000 man-hours to complete more than 2,400 drawings. The project included the moving of more than 580,000 cubic yards of earth, and the pouring of over 100,000 cubic yards of concrete, the building of more than a **mile** and a half of sewers, and the laying of more than seven miles of pipe underground and fifteen miles of pipe above ground and the installation of more than 430 miles of wiring.

I wish to thank you for this opportunity to present U. S. Steel's water quality improvement program.

Thank you.

MR. STEIN: Thank you, Mr. Dunsmore.

MR. MILLER: Mr. Chairman.

MR. STEIN: Yes.

MR. MILLER: On behalf of the Stream Pollution Control Board, I would like to enter here in response to Mr. Dunsmore's statement that they would comply with the criteria of the Conferees by the end of December 31, 1968, and then would meet the criteria for the Grand Calumet in Indiana by the construction of the facilities that come after this, that this contention was made to the Stream Pollution Control Board on October 26, 1967, when the Corporation appeared before that Board in connection with the time schedules and it was the opinion of the Board at that time that construction of all of the facilities that have been enumerated were needed to meet the criteria of Indiana and of the Conferees.

And as an example of this, in Mr. Dunsmore's presentation, by the end of this year, if my memory serves me right from the slides, there would still remain 38 percent of the oil to be removed by the additional facilities and certainly this would be a factor, I think, affecting the criteria that has been established by the Conferees in Lake Michigan.

MR. STEIN: Are there any further comments or questions?

Let me ask a question. This is largely for clarification because you have got these figures and maybe, Mr. Dunsmore, you have them in mind.

But let's say--and I would like to talk in terms of percentage of removals, and to simplify it, unless these people want more, let's talk in terms, the terms you have used, oils and solids.

MR. DUNSMORE: Yes.

MR. STEIN: Now, when we started with the Conference, by December 30, 1968, and presumable we are just talking in terms of oils and solids, from your Indiana mills, all of them, the American Bridge, Gary Sheet and Tin, the National Tube, and the steel, what percentage of oils or what percentage of solids will be removed by the end of 1968, total?

MR. DUNSMORE: The figure--in other words, we have not considered any of the American Bridge or the Universal Atlas Cement plant figures into here because they were in compliance.

MR. STEIN: Yes, they are in compliance. The others, O. K.

MR. DUNSMORE: So the figures only apply to Gary Tube Works, Sheet and Tin and Gary Steel Works.

MR. STEIN: Yes.

MR. DUNSMORE: And of those figures, the figures that I gave of 88 percent solids removal--

MR. STEIN: By December 30,1968?

MR. DUNSMORE: Yes. And you will find that at the bottom of page 5.

MR. STEIN: Right.

MR. DUNSMORE: And 62 percent oil removal.

MR. STEIN: Sixty-two. All right, now, let's move up to the total. Your next big dates--

MR. DUNSMORE: June of 19--

MR. STEIN: --are June of 1970, where you are going to have sheet and tin and the segregation water of June of 1969, right?

MR. DUNSMORE: Yes, six months from now.

MR. STEIN: Right. What will be the aggregate of the oil removal and the solids removal? I never could figure whether your six percent was figured from the beginning or later.

MR. DUNSMORE: No, you would add six percent to that sixty-two percent, so by July you would be up to sixty-eight percent on oil and--wait a minute, six percent--yes, you gained six percent on oil removal.

MR. STEIN: Yes. And how much on solids?

MR. DUNSMORE: Very little. In fact, I said only some solids, but let's say one or two percent.

MR. STEIN: All right, let's say 89. O. K. Or 90?

MR. DUNSMORE: I think it is one percent.

MR. STEIN: Eighty-nine. All right. That is in July.

Now, let's go to December 1, 1969. What kind of oil and solids removal will we get by December 1, 1969?

MR. DUNSMORE: All right. Well, in solids you pick up, as you will see in the middle of page 6, about six percent at the blast furnace when you put the scalpers on.

MR. STEIN: That is six and eight--

MR. DUNSMORE: It goes from eighty-nine to ninety--

MR. STEIN: No, on the solids.

MR. DUNSMORE: My figures show from 88 to 94.

MR. STEIN: From 88 to 94. And how much in the oil?

MR. DUNSMORE: I believe that was a four percent gain in oil.

MR. STEIN: That would be 72, right?

MR. DUNSMORE: Yes.

MR. STEIN: All right, let's work this down. December 31,1969?

MR. DUNSMORE: Well, the blast furnace is December--

MR. STEIN: First.

MR. DUNSMORE: All right, two days later, you will find that at the top of page 7, there is a nineteen percent gain in oil removal.

MR. STEIN: Nineteen. That will be 91, right?

MR. DUNSMORE: I have to see the graphs. I am not--we may have lost a percent here.

MR. STEIN: Yes. Well, I am not worried about one percent. Ninety-one. It was the solids I was worried about.

MR. DUNSMORE: Four percent on solids.

MR. STEIN: That will be 96 on the solids--or 98.

MR. DUNSMORE: Goes up to 98 on the solids.

MR. STEIN: Ninety-eight, I am sorry. And by March 1 we will have 100 all around?

MR. DUNSMORE: That is correct.

MR. STEIN: In other words, between December 31 to March 1, the oil, we may be off one, but we are gaining nine points?

MR. MILLER: Right.

MR. STEIN: Is that right?

MR. DUNSMORE: We are gaining what, nine points on oil?

MR. STEIN: Yes, nine percent on the oil on the last go-round.

MR. DUNSMORE: On that 80-inch hot strip?

MR. STEIN: Yes.

MR. DUNSMORE: Again I would have to look at those figures to be sure, because it is not quite--

MR. STEIN: I am not sure that that is--but let--

MR. DUNSMORE: I think it is something like seven percent.

MR. STEIN: Seven, all right. Here, let me--

MR. DUNSMORE: I have all the figures in my briefcase if you want to really get down to--

MR. STEIN: No, no, I think this is close enough. Let's round this off.

Here is, as I see it, what the situation is. We are going to have with the proposal of the U. S. Steel in Indiana, aside from the American Bridge, which is in compliance, and Universal Atlas, which is in compliance:

By the date set by the Conferees we are going to get a 62 percent reduction in oil proposed and an 88 percent reduction in solids.

By July of 1969 it is proposed to have 68 percent reduction in oil and about 88 or 89 percent reduction in the solids.

By December 1 of 1969 we will have 72 percent in oil and 94 percent in solids.

By December 31, 1969, we will have 92 or 93 percent in oil and 98 percent in solids.

And by March 1 of 1969 we will have 100 and 100.

I think the last push will be kind of a refinement and the finishing point, I guess, and long before we get to this we will have met the criteria of the Conferees, long before we get to the 100 percent, is that correct?

MR. DUNSMORE: We think so.

MR. STEIN: Yes. I think it is commendable. I am just putting this out for the operation date. The way I see this, it is commendable that we are shooting for 100 percent oil and 100 percent solids by March 1, 1970. But in effect, by December 31, 1969, that is by a one-year extension, we are going to have, according to your figures, a 98 percent reduction in solids and a 93 percent reduction in oil.

MR. DUNSMORE: That is right.

MR. STEIN: Which should be substantial compliance.

So except for the finishing operation--if anyone has any points here, let them bring this up--which is above and beyond this operation, I think, and maybe I will ask Mr. Perry Miller because if he had you at 93 percent reduction in oil and 98 percent reduction in solids, he probably would have reported you were in compliance with the Conferees' recommendations, wouldn't you, Perry?

MR. MILLER: This is a good question. I think this would depend somewhat on the facilities, but I think you would be safe, Mr. Chairman, that if they were that close we undoubtedly would have reported them to be in compliance.

MR. STEIN: Yes. So I think what we are dealing with here, and I am trying to do this in all candor without pushing this out, but as far as compliance and not the finishing points of the last few percentage points, we are really talking about a year extension for the Indiana mills.

Now, if this is so, Mr. Dunsmore, and you may feel you have done this, but I would like for you to address yourself very briefly to the question of why you think you may need this extra extension and what the problem was or why you couldn't meet the date.

MR. DUNSMORE: Well, you saw the photographs that showed rather extensive facilities under construction. Those photographs were taken in late November 1968 and the facilities couldn't possibly be made operational prior to July of 1969. We showed you a photograph of the blast furance area; the major portion of that job we expect to have in operation in about two weeks. It will take us right to the end of 1968. And this will increase the settling capability of the blast furnace area 30 percent.

When the scalpers are put on and the scalpers are the only thing to be put on a year later, about all the scalpers really do, in our judgment, is take out the larger portions of the solids, which are going to fall out anyway in this settling time, but it also gives us an opportunity to use chemical aids and provide a better operation. We think the scalpers are needed. But we think as far as getting the solids out of the river is concerned that when you have provided this 30 percent increase in retention time you probably are going to get out about all the solids that you can get out of the gravity sedimentation.

MR. STEIN: Yes. By the way, that is a technical answer, but maybe you can do this because I know we are going to have to face this as Conferees. Here is the issue we are facing, Mr. Dunsmore.

In 1965 you were given a 1968 date, which all the Conferees thought was reasonable at that time. The question that I think all the Conferees are asking, and I think I am speaking for them in asking you, is why when they gave you a date that they thought was reasonable, and you have the belief that a bone fide effort was made, that that date could not be met.

MR. DUNSMORE: Well, I kind of hate to remind you of this, Mr. Stein.

MR. STEIN: But you will do it.

MR. DUNSMORE: Yes. (Laughter.)

U. S. Steel and the Indiana Stream Pollution Control Board have said from the very beginning of the submission of our time schedule that we couldn't possibly get it done by December 1968. This has not been a new position. We have by extra effort been able to bring in the coke plant waste facility a year ahead of when we promised it because we felt that to get the coke plant wastes out was, I guess--I was going to say a more important target, and I don't quite mean it that way--but at least it was accomplishable, it was possible to do and it was an important pollutant.

I don't think our position has changed any. I can only say that we have pursued these projects with as much effort as it is possible to pursue them. Perhaps one of the best examples is that we are trying to bring in a basic oxygen furnace right here at South Works in Chicago, and try as we will we wanted to bring that into production over a year ago and it is not in production yet.

So I can tell you, as has been reported by others here, that delays in equipment, difficulty in getting all the necessary engineering done and getting contracts let and the job completed is--

MR. STEIN: You brought up the South Works. When are you going to be completed with that?

MR. DUNSMORE: As Mr. Bacon said this morning, we believe we meet now.

MR. STEIN: When are you going to complete all of your waste treatment--

MR. DUNSMORE: Step 2 of it?

MR. STEIN: Yes.

MR. DUNSMORE: We believe that that will take us until, I believe it is, the first or second month of 1971. I think it is just a few months past 1970.

MR. STEIN: You mean about February 1971?

MR. DUNSMORE: That is correct.

MR. STEIN: Longer than any of the dates we have for your Indiana mill?

MR. DUNSMORE: That is right.

MR. STEIN: By 1968 what do you figure your percentage of oil reduction and solid reduction is going to be at South Works?

MR. DUNSMORE: Solids, we have--I guess I will have to say that on solids reduction we will be pretty close to our goal, because we have just in Step 1 included a modern clarifier for the blast furnaces that did not have clarification.

MR. STEIN: What is your goal? Are you going to have the same goal at the South Works of 100 percent reduction in solids and oils that we have in Indiana?

MR. DUNSMORE: We are saying it a little bit differently, and I don't want to confuse the Conferees on this. The goal is what the standard permits. In other words, the SWB-15 has a different standard than what is permitted in the Grand Calumet River. Not very much different, I admit, but there is some difference; one will say 25 parts per million, another one 40 parts per million.

So when we talk about a goal, we are talking about meeting a goal of what the standard is.

MR. STEIN: According to the statements you have made, by the middle of 1970 in your Indiana operations you are going to achieve 100 percent reduction in oils and solids?

MR. DUNSMORE: Of the goal.

MR. STEIN: Yes.

MR. DUNSMORE: Of the goal.

MR. STEIN: You are not going to get 100 percent reduction?

MR. DUNSMORE: Never can get 100--well, it depends on what you mean by 100 percent.

MR. STEIN: Yes.

MR. DUNSMORE: If your goal for a stream standard, let's say, is 25 parts per million, then we are saying that when we meet the 25 parts per million that is 100 percent of the goal.

MR. STEIN: All right.

MR. DUNSMORE: But that is not 100 percent solids removal, I want that clear.

MR. STEIN: All right. Now, how close are you going to come to the goal--and we can expect in Chicago we are going to run, what, six to eight months later than we are running in Indiana--how much of the goal are you going to reach when you finally get to that goal? Are you going to get to 100 percent of the goal like in Indiana both solids and oil?

MR. DUNSMORE: Yes, we will.

MR. STEIN: By, let's say, the end of February 1971?

MR. DUNSMORE: Yes.

MR. STEIN: How much percentage of the goal are you going to get there by the end of 1968?

MR. DUNSMORE: Well, on solids I believe that we will be very close to, well, let's say 90 percent of the goal by December 1968.

MR. STEIN: And the oils?

MR. DUNSMORE: And the oil, it is very hard to say because we are in a major recycling system right now which is retaining substantially all of the oil, but we don't like the way we are doing it because it is tough on the mill, and so we are going to provide rather extensive treatment facilities to ease up the maintenance problem and to finally get rid of that last little percent of oil which we can't do by makeshift methods by recycling.

And when I say makeshift methods, you saw some films here from Inland Steel, for example, where they are using lagoons. They said, and I agree, that those are temporary expedients to correct the problem now, but you don't want to live with a problem like that for a long while. And so, therefore, you go ahead and spend money for a terminal treatment facility that will make it easier to maintain on the long haul.

MR. STEIN: You wouldn't care to give a figure, then, on what you are going to have reductionwise?

MR. DUNSMORE: Not percentagewise. I don't have any basis on which to--we haven't computed it as we have in the Gary facilities and I am not in a position to compute the oil or the solids, for that matter. I just took a guess at the solids.

MR. KLASSEN: Mr. Chairman, this might be a good place to raise this point. I think it is one that this Conference should be interested in. The criteria on oil for the lake that has been set by this Conference says substantially free of visible floating oil. I think this is what this industry and the rest of them have been addressing themselves to. However, this particular industry, as I understand it, is faced with an Illinois Supreme Court decision that says no oil, zero oil. Now, these two standards are in conflict. Which supersedes which I am not here to say, because I never try to criticize the Supreme Court.

MR. STEIN: That is right. You know, I came up with this and I think the--I don't know the inevitable consequence of that faced with that decision, and I don't want to embarrass U. S. Steel or Mr. Dunsmore, but I guess the way we have always worked this operation is to get a reasonable degree of figures and we have gotten his oil figures in Indiana, 62, 68, 72, 73, 100, and we can make a judgment and know where we stand. I am not sure that faced with that court decision, if I were representing U. S. Steel, that I would admit we are putting out any oil either and be able to give an answer to that question.

But I guess this is one of the things we are going to have to face with our system and we are just going to have to recognize that these decisions are the law of the land and we are going to have to meet them and try to get our information as best we possibly can.

MR. DUNSMORE: I would like to speak some more about the problem that you are alluding to.

In establishing this recycle system, we put on oil skimmers at every point that it was possible to get some more oil, even small amounts of oil, and then when that was done and we closed up the recycle system, we purchased a boat which is capable and is used daily to more or less mop up, if that is a good expression, it has an oil skimmer on it, to get very minute traces of oil, the iridescent oil that gets away. So you are talking about very small amounts.

MR. KLASSEN: I understand in this

particular case in question the court admitted in the opinion that there was only from two to six gallons discharged into Lake Michigan that was the basis for this court decision. This is getting down to some pretty small amounts, but I am not criticizing the Supreme Court decision, obviously, but this seems, quite frankly, a little impractical.

MR. STEIN: Let me try to summarize your position on the delay. If I am incorrect, Mr. Dunsmore, correct me.

I think your statement, as always, and I think U. S. Steel's information that we get from them, operating within the scope of the American legal system in asking you what you can reveal and what you can't reveal to stay alive, has been completely candid, and I agree with that.

But your view from the beginning is that the notion of the 1968 deadline for doing the job was too tight and you could not, making that effort, do that. While the Conferees representing Indiana, Illinois, the Sanitary District and the Federal Government agreed on the date, your contention was that this date was too tight and it couldn't be done, the work couldn't be done in that time, that you have taken and moved diligently toward a cleanup and the kind of schedule you have come up with, given the problems of space that you have, the problems of production, the problems of getting equipment, has been what you would consider a reasonable compliance with the Conference directive.

Is that a fair statement of your position?

MR. DUNSMORE: I wouldn't want to call it a reasonable compliance. We believe we have complied with the Conference objectives in both cases.

MR. STEIN: The Conference says it has to be cleaned up by 1968.

What I wonder is why it would have to take you longer in the South Works than it took you in Indiana?

MR. DUNSMORE: We feel that the second step in the case of South Works will bring us into compliance with SWB-15 and in the case of Indiana will bring us into compliance with the effluent discharge criteria of the Indiana Sanitary Water Board for the Grand Calumet River. Now, whether one is further along than the other, I suppose you could say that we got started on the sheet and tin plant earlier than we did at South Works simply because we had to build an 84-inch hot strip mill and, therefore, we were forced into an industry decision sooner on how to handle the treatment facilities. So we had that advantage.

MR. STEIN: Well, here is the point I make, by December 31, 1969, in the Indiana situation you are going to remove 93 percent of the oil and 98 percent of the solids, which is getting along pretty well,and you are not going to be really up there in the South Works until what, a year and two months later?

MR. DUNSMORE: Well, of course, I didn't bring the South Works program here, but I want you to know that when it is completely reviewed and evaluated and approved, let's say, by the various control agencies, we do have a step program that goes piece by piece through the South Works to bring it up. It won't all come in on one day. There will be a blast furnace area that will come in and electric furnace area that will come in.

MR. STEIN: As I point out, you know, just for U. S. Steel's public image, it might be better to present that like we presented the other program. The difficulty in cloaking this in a mystery is that the presumption tends to run against you when you are talking about extending a date. And I have always felt this. There have been some other steel companies in some other cases who the press and everyone was condemning about the program. This is in yours and in other cities. But when they made a full presentation of the program they weren't doing too badly, I didn't think. It has always amazed me that this stuff doesn't come out.

MR. KLASSEN: I think for purposes of the record here, Mr. Chairman, that I want to say, and you are the one that said it, that there has been no request, and, therefore, no approval by the Sanitary Water Board of the State of Illinois to extend the September 30, 1969, deadline, and this is the first I have heard that it might not be met. I think it is presuming a lot on your part to say that they are not going to meet this until a later date than the other ones because there has been no request made and no approval of an extension.

MR. STEIN: Let me ask you, does the Sanitary Water Board have the jurisdiction over that or do they ordinarily come to you for a permit on the date?

MR. KLASSEN: They do not. The Chicago

Sanitary District has the prime responsibility, but if that dateline is not met, then the Sanitary Water Board is obligated to take action against the Chicago Sanitary District.

MR. STEIN: We have had this from Indiana. As I understand this from Mr. Miller, he has requested that we give consideration to these extended dates in Indiana. However, as far as I understand your position, there has been no similar request that we extend any date in Illinois. Is that correct?

MR. KLASSEN: That is correct, and I have not heard any request from any Conferee that there has been a request to extend these dates in Indiana.

MR. STEIN: Oh, in Indiana?

MR. KLASSEN: Has there been a request?

MR. STEIN: Mr. Miller has, I thought I heard him. Didn't you?

MR. POOLE: Well, there was a request in 1967 from Indiana.

MR. STEIN: Didn't you repeat this? I think the record will show.

Let Mr. Poole speak.

MR. POOLE: Let me clarify some of these

things that have been going on here. (Laughter.)

The dates were not adopted in 1965. The dates were adopted by the Conferees on February 2nd, 1st or 2nd here, after hearing two or three sessions and hearing the reports of the technical committee. At the time they were adopted I pointed out, and I believe a search of the record will show, that in my judgment there were some industries in Indiana that could not meet the December 31, 1968, date.

The conclusions of the Conferees did contain the dates that have been enumerated a half dozen times here today. They also included two additional provisions which have not been mentioned here today that I think I should read, and this was Conclusion No. 3:

"The Conferees recognize modifications in this schedule may be necessary. These include:

"(a) A lesser time when the control agency having jurisdiction considers a practical method of control can be in operation prior to the time stated.

"(b) In a few industries some variation from this schedule may be sought from appropriate

> State and local pollution control agencies. In such cases, after review the Conferees may make appropriate recommendations to the Secretary of Health, Education, and Welfare."

Now, in the interim between February 1966 and our latest 1967 meeting, for which no conclusions have ever been issued, and as far as I know no record of the proceedings of the last 1967 Conference developed, the Indiana Pollution Board, having knowledge of this difference of opinion about dates, had a formal meeting with the three steel mills, two of whom you have already heard from here today, and asked them before the meeting for a long hard look at their proposed schedules and to present to us the best schedule that they thought they could attain and at the same time to present reasons why they could not do better than that. This is the schedule which Mr. Miller has presented in his presentation for the Inland Steel and for U. S. Steel. This is the schedule that I have discussed with Conferees at the September-- I don't know whether it was September 1967--the meeting late in 1967, and on which there was no action. Well, there was action and then there was a reversal of the action.

So as I see it, and where we are here

today, and I am saying this because I want to know from Mr. Dunsmore now and perhaps I should have asked Mr. Brough, but these companies have presented a formal request to the Indiana Stream Pollution Board for an extension of the time beyond December 1968, which includes all of the dates that are included in our presentation. So first I think the matter of extension of time has been before the Conferees before today. I think both Mr. Miller and I, or I think Mr. Miller when he was presenting it, thought that what he was transmitting to the Conferees was a request that had originated with the three steel mills in the meeting before the Indiana Board when we had this final session on timetables.

Now, just one more thing and I will quit.

We disagree with Mr. Dunsmore's conclusions that he is meeting the criteria that was established or adopted by the Conferees. I think I would also have to disagree with John Brough for Inland. The reason I disagree is that there is oil still coming out of the Indiana Harbor turning basin at our sampling point and is getting into Lake Michigan. The report that Mr. Poston's office prepared documents this pretty thoroughly. It is our view that as long as visible oil is present in Lake Michigan and as long as we have got major producers of oil back on the Grand Calumet watershed that they are contributing to that oil that is visible that comes out of the Indiana Harbor shipping canal. Maybe before we get through with this we are going to have to tag it to find out exactly whose oil it is, but I don't think anybody can refute the fact that it is still there.

MR. STEIN: Are there any comments or questions?

MR. KLASSEN: Are we speaking to an extension of time?

MR. STEIN: No, no.

MR. KLASSEN: All right.

MR. STEIN: Let's take the point up on procedure.

By the way, Mr. Poole, I did have in my prepared opening statement a paragraph, "quality criteria be subject to adjustment based on laboratory findings, and that flexibility of time schedules be granted where lesser or greater time needs could be justified." As to what the Conferees agreed to, I purposely left it out because I figured you would bring this up at an appropriate time and I didn't want to spoil the drama. (Laughter.)

So you are right.

MR. DUNSMORE: Are you through with me?

MR. STEIN: Yes.

MR. POSTON: How about getting pictures from Mr. Dunsmore?

MR. STEIN: Mr. Dunsmore, do you have copies of those slides to submit as exhibits or do you need them or what is the situation?

We can discuss that later. If you want to put them in as exhibits, they will be in. If not, we will talk about it. O. K.?

MR. DUNSMORE: I believe we have the important ones here.

MR. STEIN: Yes, all right.

But I think Mr. Klassen's point still remains. And Mr. Poole, you are exactly correct. I think Indiana has had this position and maintained it for a long time. I think it is before the Conferees--that they thought these modified time schedules were in order and that is with the caveat that they have that possibly, unless the work is done, that all the criteria not be met. But as far as I know there has been no move before the Conferees to have any extension by any of the

Conferees of any time schedule in Illinois. Now, if I am wrong on that statement, I would like to be corrected. The Conferees, of course, can make any judgment they want at any time.

But I think we have had quite a bit of a session and let's recess for 10 minutes.

(RECESS)

MR. STEIN: Let's try to finish up with the industries. Let's reconvene, please.

Universal Atlas Cement.

MR. MILLER: Universal Atlas Cement Division, U. S. Steel Corporation, Gary, has a sanitary sewage treatment plant with effluent chlorination for handling domestic wastes. Inspections by representatives of the Board and results of effluent analyses show that adequate waste control is being provided, and this plant is in compliance with the requirements of the Conference.

MR. STEIN: Vulcan Materials.

MR. MILLER: Vulcan Materials Company, Metallics Division, Gary, has a septic system with absorption into the ground for domestic wastes.

Inspections by representatives of the Board and results of effluent analyses show that adequate waste control is being maintained, and this one is in compliance with the requirements of the Conference.

MR. STEIN: How about Youngstown Sheet and Tube?

MR. MILLER: Youngstown Sheet and Tube, domestic wastes are discharged to the East Chicago sanitary sewerage system for treatment in the District's plants.

Construction was completed during late 1967 on the gas cleaning and recirculation system for the No. 2 open hearth operation and the waste pickle liquor collection facilities for the No. 1 tin mill. During early 1968 the No. 3 hot strip mill waste treatment facilities were placed in operation. Construction is proceeding on the Buttweld Mill waste treatment facilities which are to be completed by December 31, 1968.

Construction has started on the five remaining projects involving treatment of wastes from the No. 1 and No. 2 tin mills and the No. 2 cold reduced sheet mill--I understand these two projects have been complying--the hot rolling mills, blast furnaces, and terminal clarification and reuse of wastewater from the No. 5 tandem rolling mill and No. 3 cold reduced sheet mill and the No. 3 hot strip mill. A summary of the projects completed and under construction appears in Table I.

The Company's proposed waste treatment facilities should provide adequate waste control.

Now, the time and dates on these for

Youngstown, these are on page 17. I understand projects 5 and 7, it was found when they got into this, had to be carried out as one, and the dates for these, the No. 1 tin mill, the No. 2 tin mill and No. 2 cold reduced sheet mill are December 31, 1969.

The hot rolling mills, June 30, 1969.

The blast furnace area, June 30, 1970.

And the north lagoon, which is a settling lagoon, is June 30, 1970.

Now, then, Mr. Chairman, I would like to call on Mr. Carl Broman, who is Superintendent of Fuel and Environmental Control for the Youngstown Sheet and Tube Company.

MR. STEIN: All right. I wonder if we might ask you when you make the presentation to have the same kind of broad analysis, if you possibly could, that we asked of U. S. Steel. If the dates are in fact December 31, 1968, June 30, 1969, and June 30, 1970, could you furnish data indicating the possible amount of reduction that we can expect in oils and solids in each one of those interim dates, sir?

MR. BROMAN: I was working on that during the discussion, and I can only give you an estimate on one or two of the figures.

MR. STEIN: All right. I will tell you what we can do. We are no doubt going to have to go into tomorrow, and you can make your presentation and then possibly if you want to compute that over the evening and then present it, we may be in better shape.

MR. BROMAN: I have computed it pretty closely.

MR. STEIN: All right. If it is agreeable, I think that would be helpful.

PROGRESS REPORT OF THE YOUNGSTOWN SHEET AND TUBE COMPANY, CARL BROMAN, SUPERINTENDENT OF FUEL AND ENVIRONMENTAL CONTROL AT THE INDIANA HARBOR WORKS

MR. BROMAN: Mr. Chairman, Conferees, ladies and gentlemen. My name is Carl Broman and I am Superintendent of Fuel and Environmental Control at the Indiana Harbor Works of The Youngstown Sheet and Tube Company. As you know, The Youngstown Sheet and Tube Company operates a major steel mill on Lake Michigan on the west side of the Indiana Harbor Ship Canal.

C. Broman

I am appearing on behalf of the Company at the request of the Stream Pollution Control Board of the State of Indiana. The letter of invitation suggested that our presentation include the facilities that have been completed, the reductions in waste loads provided by those facilities, the work that remains to be completed and the expected completion dates, and the reasons why the work cannot be completed earlier.

I will discuss first the work which has been completed.

Completed Facilities

We have noted in our earlier presentations that the Company has been actively working for many years to improve and control the quality of our water discharges. We worked then, as we do now, with the Stream Pollution Control Board of the State of Indiana. While I am sure that the Conference is most interested in the progress since the Federal Water Quality Control Act of 1965, I would like to summarize briefly our work prior to that time in order to place our recent accomplishments in proper perspective.

The period 1949-1965

In 1949 we installed the necessary sewers and facilities to separate sanitary wastes from the industrial wastewaters, and to connect our sanitary system to the East Chicago municipal treatment plant. We are sending no sewage to the canal or the lake.

Since 1950 we have also had a continuing program to install industrial wastewater control facilities.

In 1950 we began a program of hauling the spent acid from conduit pickling, No. 2 sheet mill, continuous weld tube mill, merchant mill, No. 2 tin mill, and No. 3 sheet mill, for disposal on slag.

In 1951 there was initiated a continuing program of construction of settling basins for scale recovery. Primary scale collecting facilities were provided for the 11 hot rolling mills at the time of their construction. In 1955-56 an additional large scale collection basin was constructed at the lakefront for further scale recovery from the waters of eight of our hot rolling mills.

In 1952 a 60-foot diameter settling basin and clarifier for recovery of flue dust from gas washer water was installed at the blast furnaces, and in 1955 a second clarifier was placed in operation.

In 1955 separate waste collecting systems were built for the new No. 2 tin mill to provide controls to prevent discharge of acids and plating solutions.

In 1956 a dephenolizer was placed in operation at the coke plant for recovery of phenols from coke plant ammonia liquor.

In 1959 oil recovery facilities were installed to provide control of oil emulsions used on the cold rolling mills.

In 1963 a program was initiated to install improved oil recovery facilities at the rolling mill scale basins. Under this program, as of 1965 additional oil recovery facilities had been installed at the hot strip mill, the six stand mill, and No. 3 cold rolled sheet mill.

The period 1965 to Date

Since 1965 the following installations have been completed:

In 1965 an oil belt recovery system was installed at the No. 1 scale pit of our No. 3 seamless pipe mill. This system required the installation of a belt in the scale pit to remove floating oil, machinery to drive the belt, a storage tank to provide for oil-water separation and related piping and pumping facilities.

C. Broman

In 1966 a similar oil belt recovery system was installed at the lake front scale pit, which serves all the primary steel mills.

In 1967 we installed a 30,000 gallon tank at our No. 1 tin mill, with related piping and pumping facilities to collect waste sulfuric acid from the 54-inch hot strip mill picklers. With the completion of this installation, discharge of spent acid to the canal was completely eliminated.

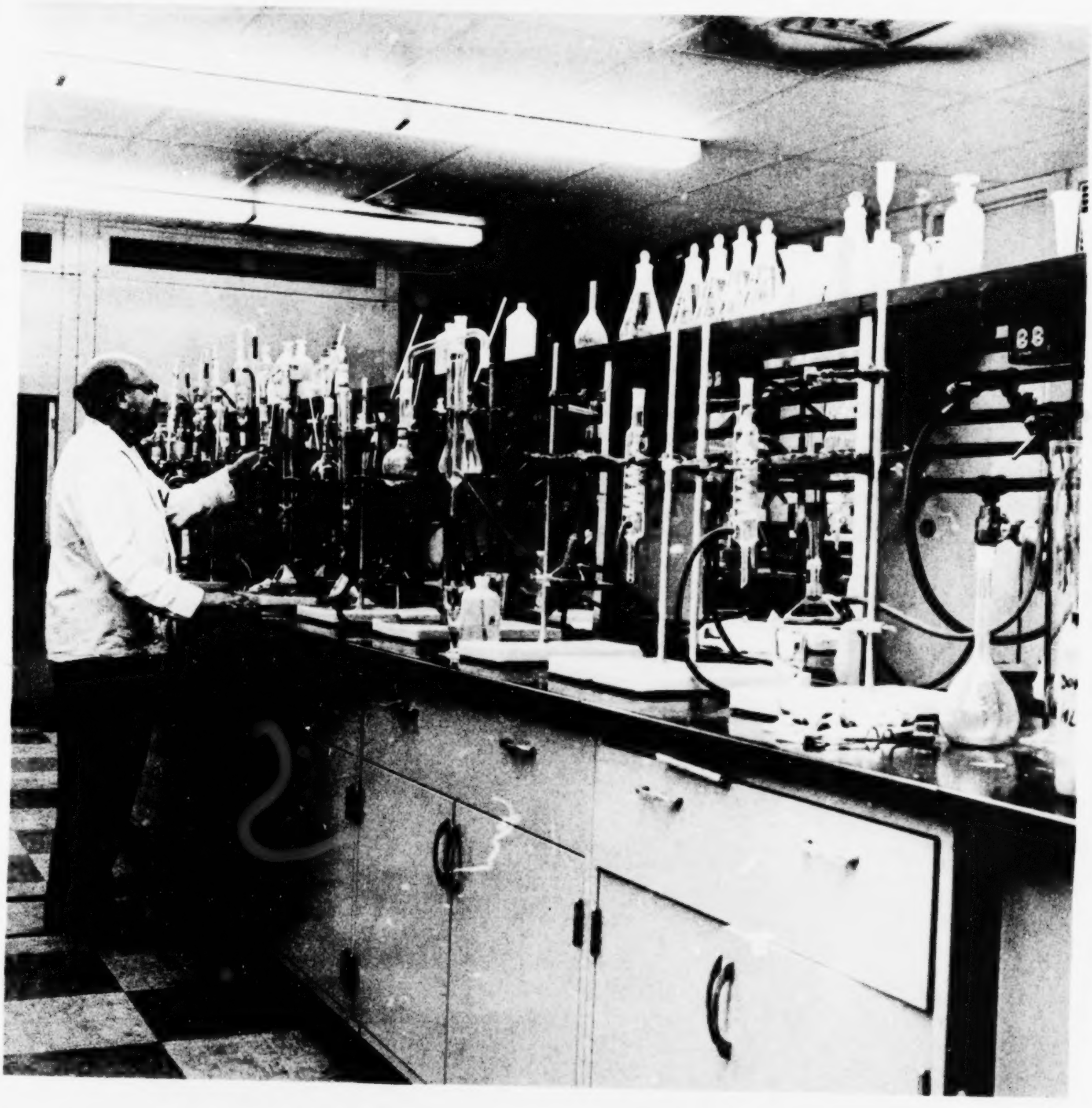
In 1967, the program to control coke plant wastes was completed. Under this program the still wastes from the coke by-product plant are pumped to the City of East Chicago wastewater treatment plant for treatment under a contract between the Company and the City of East Chicago. The program involved the installation of a detention tank for gravity separation of solids, pumping facilities, and a force main for conveying the waste to the district sewer. Also included in the program were a naphthalene scrubber, and changes in by-product plant operations. The total cost was nearly a million dollars and required approximately two years to complete, partly because of the long leadtimes required to obtain necessary equipment.

C. Broman

Operating experience since completion of the system indicated the advisability of replacing the pumps. In practice we learned that the pump design, which theoretically had sufficient capacity, did not actually produce the required head with the particular waste involved, so new pumps were ordered. A strike at the pump manufacturer's plant delayed delivery but the replacement pumps are now on hand and are currently being installed with completion of installation expected in January. This is an illustration of the practical difficulties experienced in the design and construction of facilities and of the considerations which must be included in setting completion dates.

We have also completed other facilities which, while not treatment facilities as such, enable us to better monitor and control our treatment program. These are the automatic samplers installed in 1966 to take 24-hour composite samples at outfalls and intakes, and an environmental laboratory completed in 1967 which gives us centralized on-site facilities for wastewater analytical work.

No. 1 - Environmental Lab
Exterior View



No. 2 - Environmental Lab

Interior view

C. Broman

New Hot Strip Mill Waste Treatment

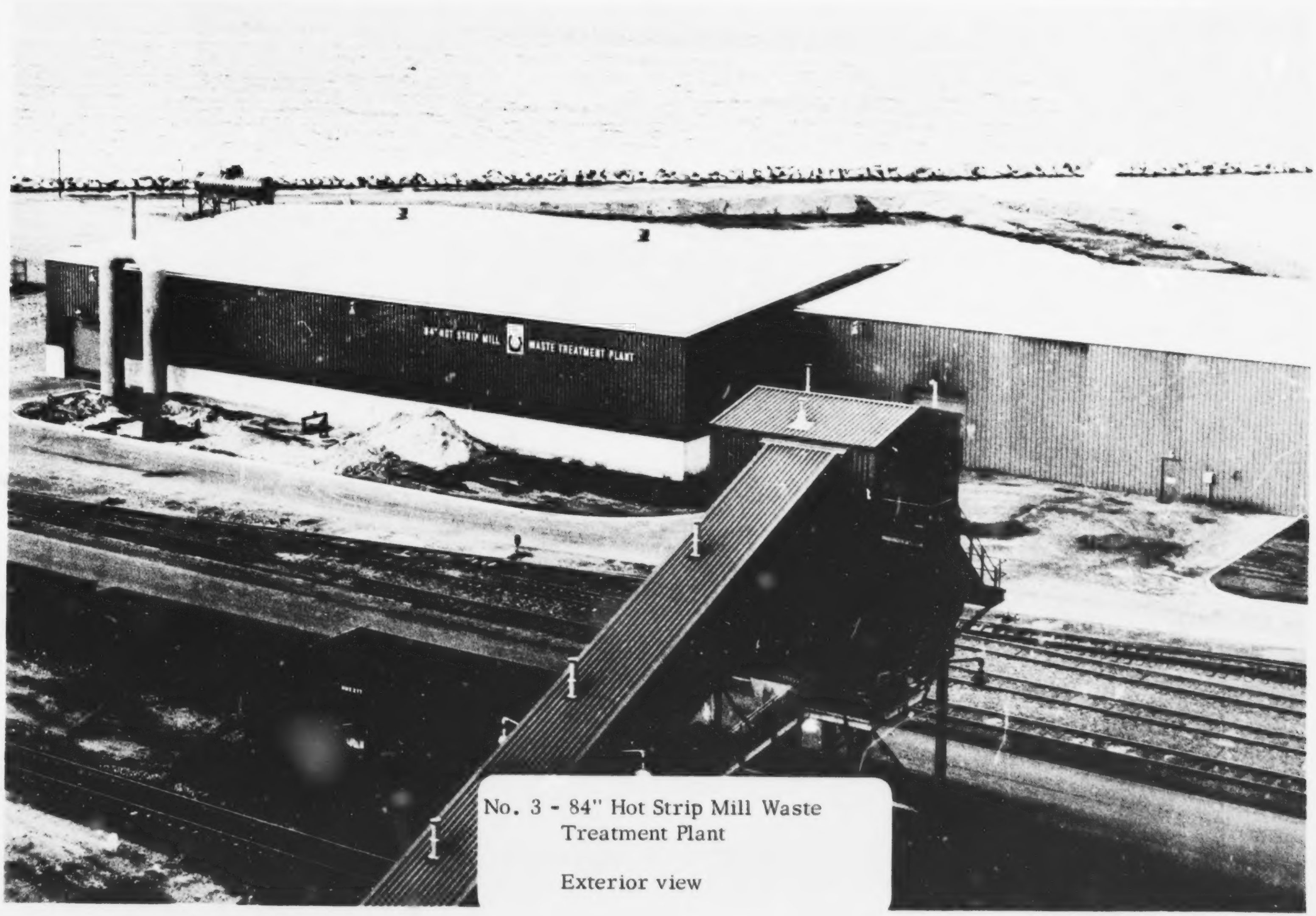
One of the recent installations in which we take great pride, and which has created much interest in the industry, is the high pressure water filtration system provided for our new 84-inch hot strip mill. This system, which went on line this year, is the first of its kind in the United States, and the largest of its kind ever built. The 42 filtration tanks, each 16-1/2 feet in diameter, are located in a 50,000 square foot building north of the new mill, and can treat 60,000 gallons of water per minute. The system includes two scale basins, with modern scale recovery equipment and a series of nine large tanks for chemical treatment of oily wastewaters. Our experience of nearly a year with this facility shows that we are able to attain a water quality which more than meets the applicable state criteria.

Our new 84-inch hot strip mill has replaced the older 54-inch mill. The result has been the discontinuance of discharges from the older facility and the elimination of the waste load--oil and suspended solids--which it had contributed. The installation of this major wastewater facility costing approximately $6 million represents a major improvement in our environmental control program.

Pictures of the new waste treatment facility are bound with our printed statement.

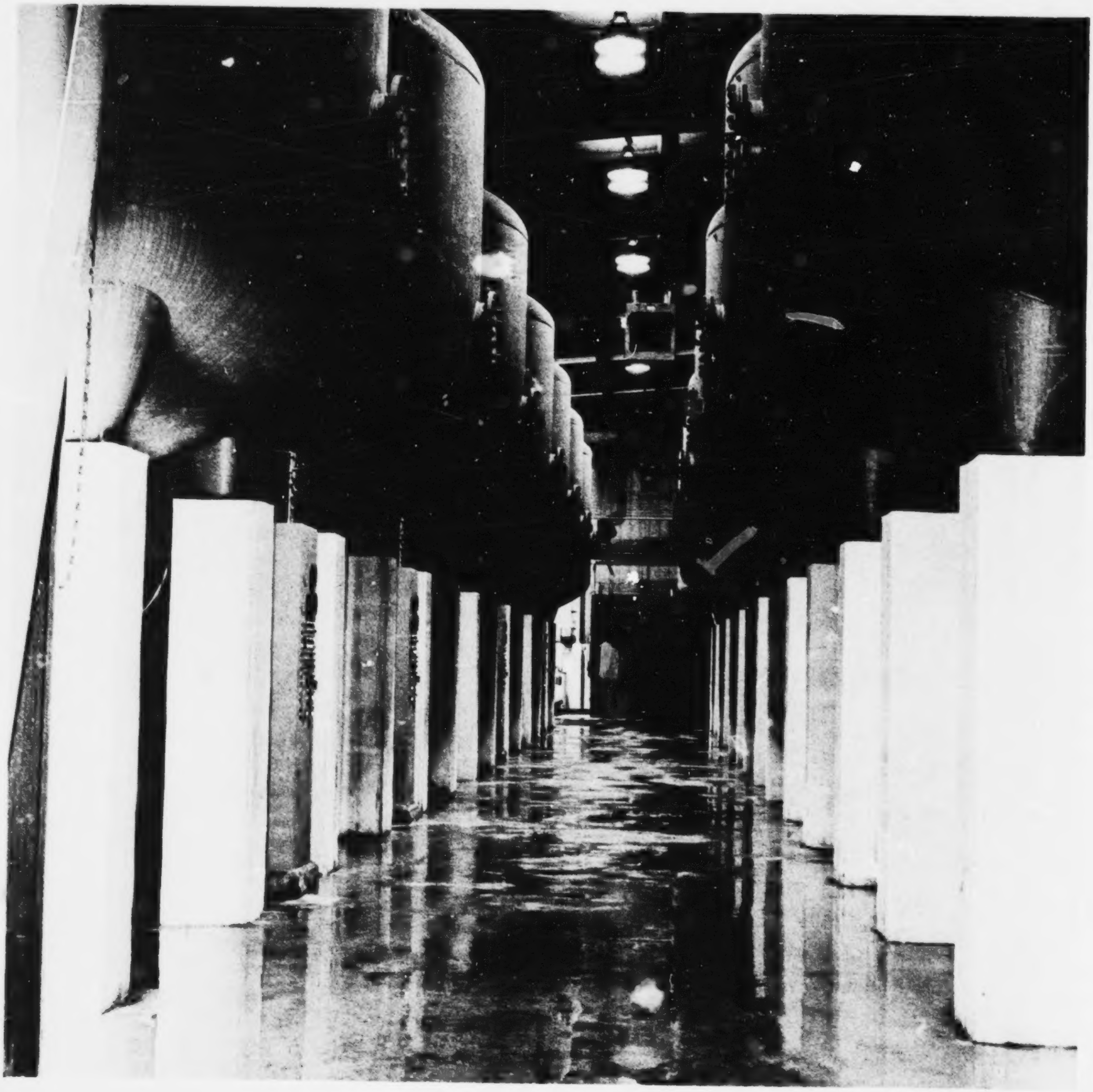
No. 2 Open Hearth Gas Cleaning System

We also would like to mention here that we have completed this year a closed wastewater treatment system to prevent water pollution in connection with the installation of air pollution control facilities at our No. 2 Open Hearth Shop. The Company has installed venturi scrubbers on all of its open hearths in that shop. These scrubbers completely eliminate the red dust from these open hearths. Operation of the cleaning system, however, requires large amounts of water which in turn becomes polluted with the materials in the gas from the open hearths. The water treatment system cleans the wastewater from the scrubbers and the waters are then recycled, thus avoiding water pollution. The system includes clarifiers, centrifuges, chemical treatment, cooling towers and pumping equipment for total recirculation. The picture of the cooling towers, included in the bound presentation, gives an idea of the scope of this installation.

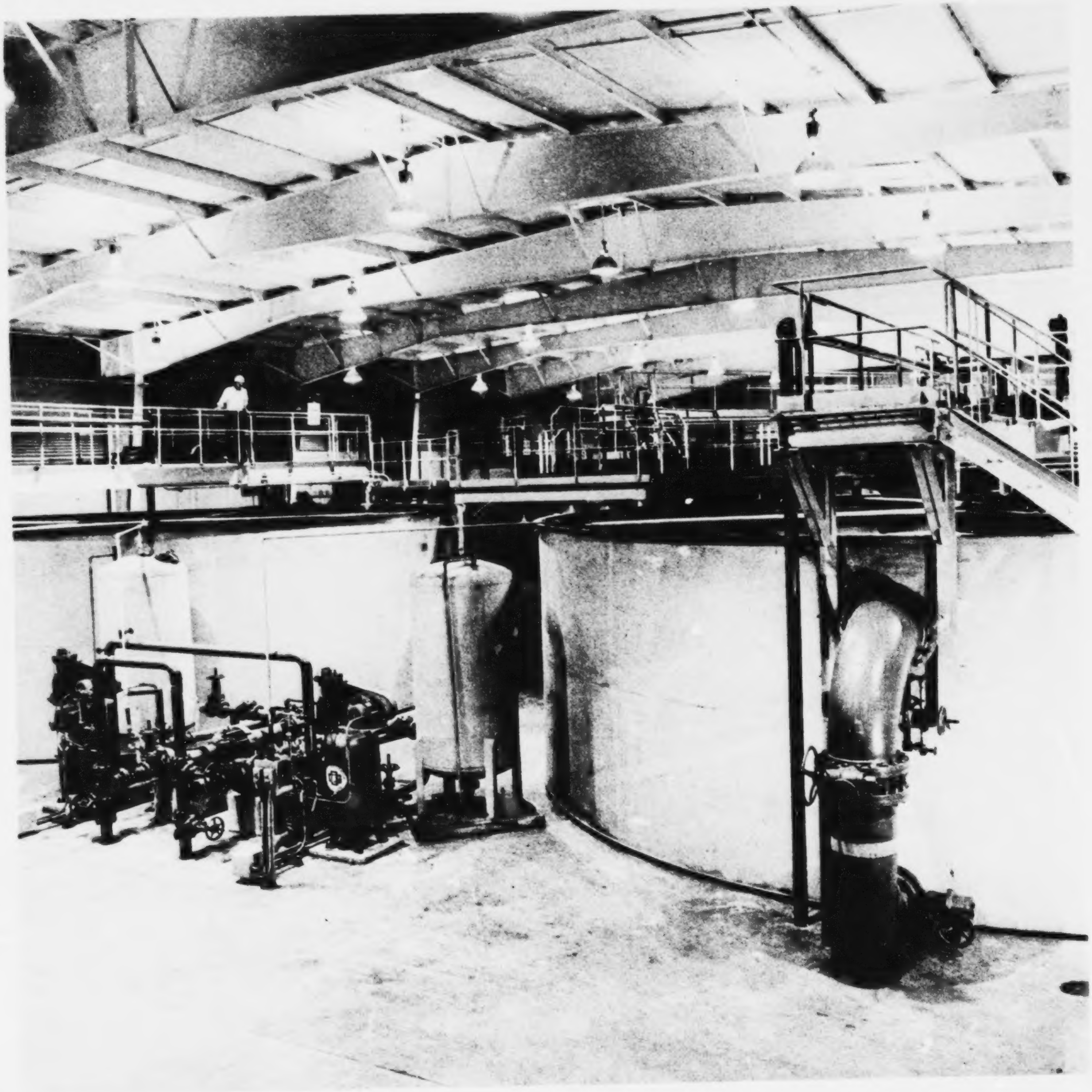


No. 3 - 84" Hot Strip Mill Waste
Treatment Plant

Exterior view

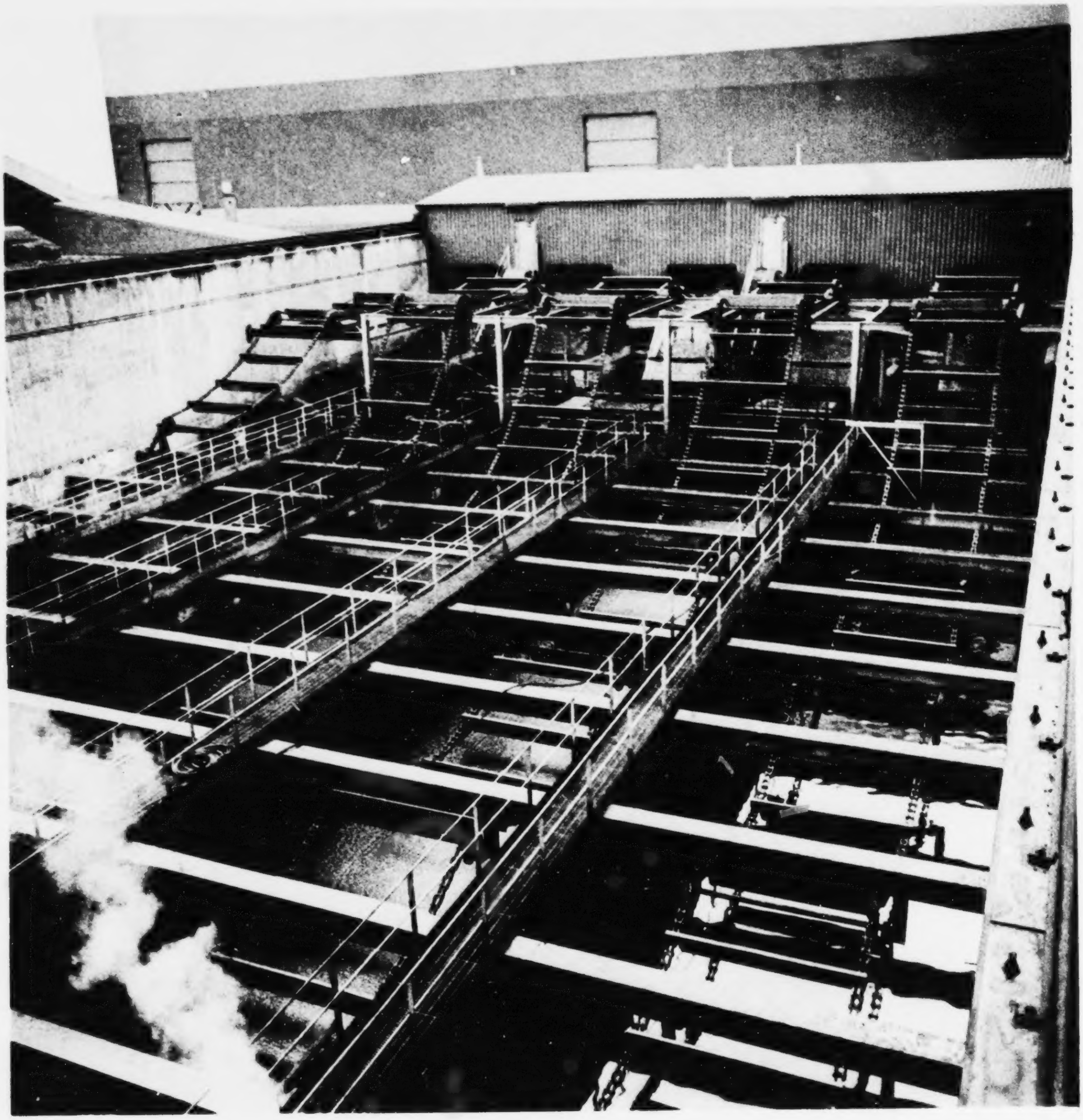


No. 4 - 84" Hot Strip Mill Waste Treatment Plant
Interior view showing some of the 42 high pressure filter tanks.

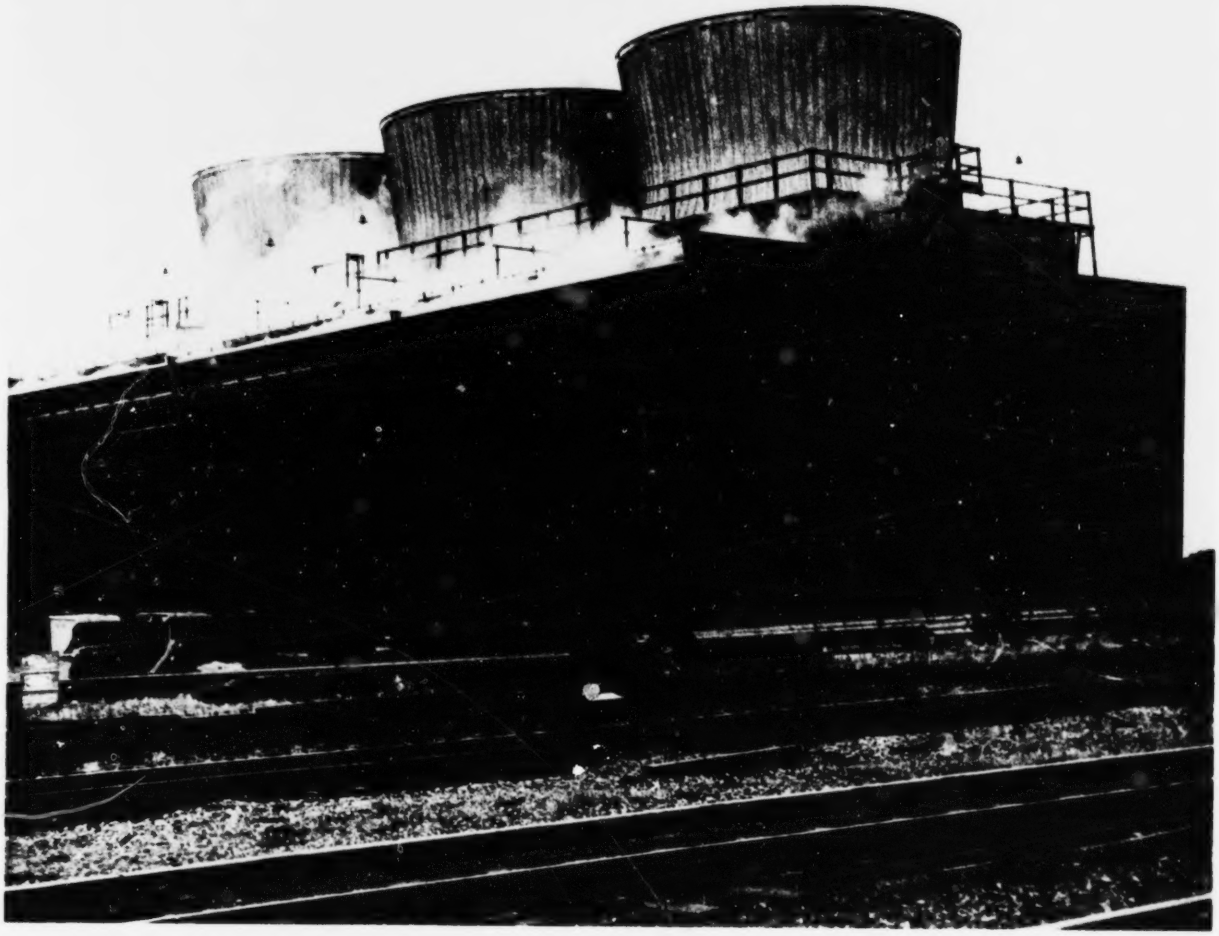


No. 5 - 84" Hot Strip Mill Waste Treatment Plant

Interior view showing some of the chemical treatment tanks for oily waste.



No. 6 - Scale Pit No. 2, 84" Hot Strip Mill, showing modern scale recovery system



No. 7 - Cooling Towers for No. 2
Open Hearth Gas Cleaning
System

C. Broman

CONSTRUCTION NOW UNDER WAY

Four principal water pollution control projects are now in the course of construction.

Continuous Buttweld Wastewater Filters

The first is installation of a high pressure filtration system at the continuous buttweld pipe mill for removal of mill scale and oil. This filtration system is the same type as that which has given excellent results at our new hot strip mill. There are three 16-1/2 feet diameter filters, with accessory piping and pumping facilities, which has capacity to handle twice the present flows. Pictures 8 and 9 show the status of this construction as of last week. Barring unforeseen difficulties we expect that this system will be completed and in operation by the end of this month.

No. 8 - Installation of tanks for high pressure water filtration system, continuous buttweld mill

No. 9 - Installation of tanks for high pressure water filtration system, continuous buttweld mill

Central Treatment Plant

The second project now under construction is a central treatment plant at the south end of our property. This treatment plant will collect the wastewaters from three plant areas--the No. 1 tin mill, the No. 2 tin mill and the No. 2 sheet mill. These areas are the principal sources of soluble oil wastes. At the treatment facility the wastewater will be treated with chemical flocculants to precipitate the soluble oils which will then be removed from the water by settling. The facility, which covers 70,000 square feet, includes thickeners, clarifiers, flocculators, chemical mixing and settling tanks, and sludge removal and oil separation equipment, plus necessary piping and pumps. The site has been cleared, excavation is completed and the foundations are now being poured. Construction is proceeding as quickly as possible and we should be able to meet our 1969 completion date on schedule.

MR. STEIN: Pardon me, just for clarification, is that the June date which was given by Mr. Miller?

MR. BROMAN: No.

MR. STEIN: Can you be more specific?

I notice you have these through so we won't have to go back. This might save some time.

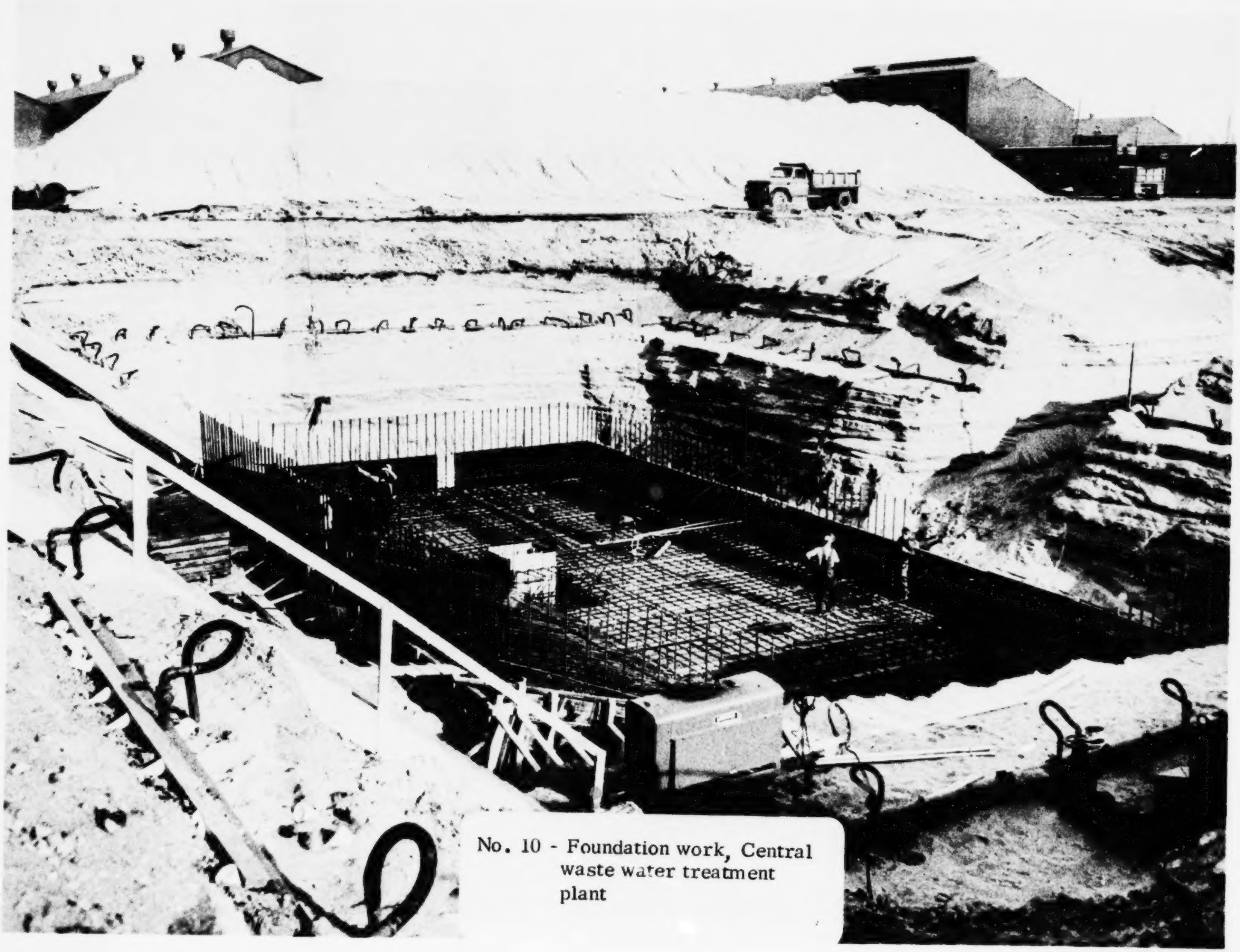
MR. BROMAN: The central treatment plant is scheduled for completion in December 1969.

MR. STEIN: December 1969. All right.

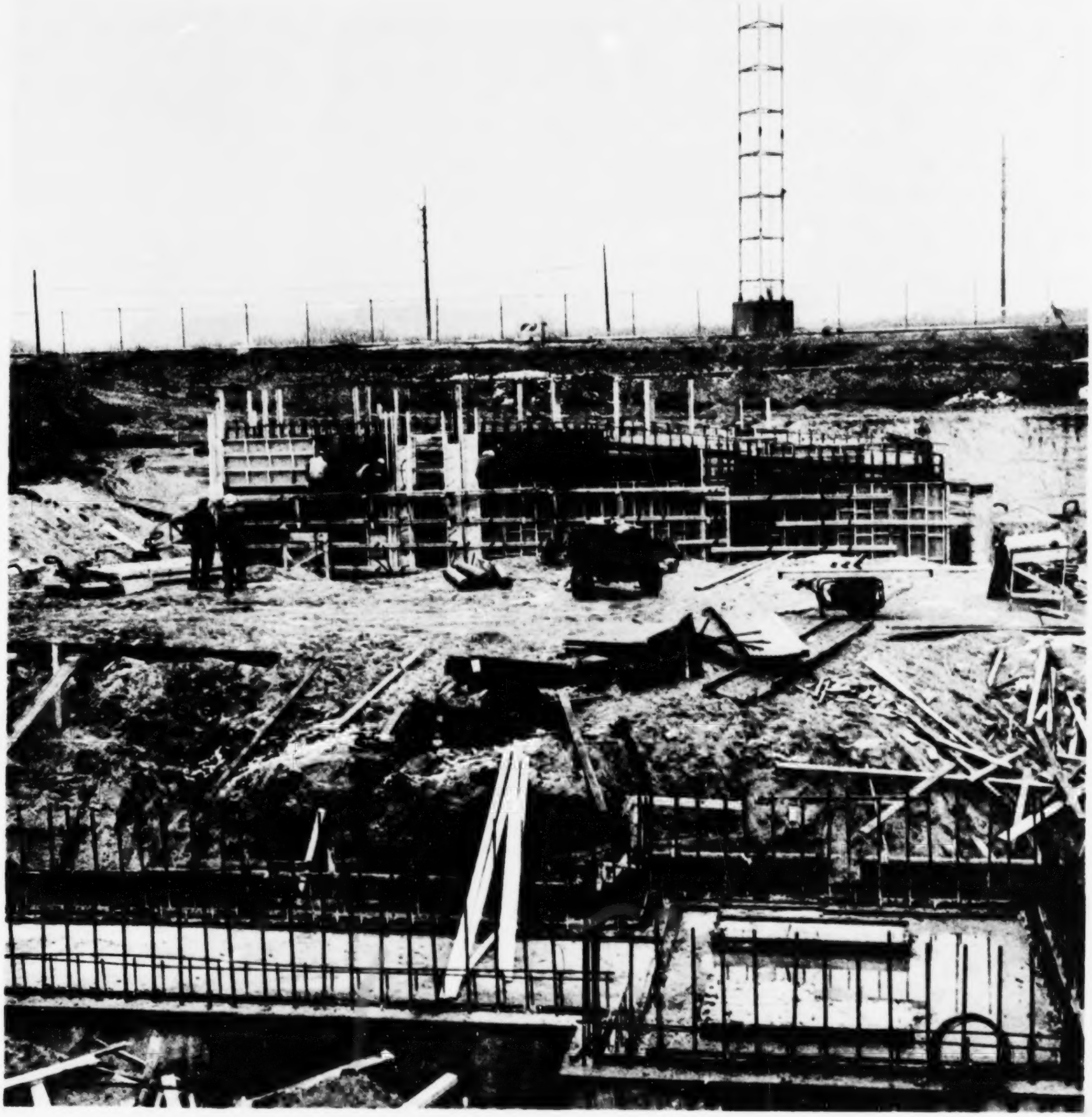
MR. BROMAN: And of course the open hearth system is completed. The buttweld filters is scheduled for the 31st of this year.

MR. STEIN: Yes. Right.

MR. BROMAN: Pictures 10 and 11 show the status of construction as of recent dates.



No. 10 - Foundation work, Central waste water treatment plant



No. 11 - Foundation work, central waste water treatment plant, later view

Expansion of Blast Furnace Wastewater System

The third project involves the blast furnace area, and consists of two phases. At present there are two thickeners or clarifiers which remove solids from the blast furnace gas washer water system. The first phase of the project involves the construction of a third thickener or clarifier. This will increase the settling capacity and is necessary to the second phase which is a recycling system. When the first phase of the project is completed, the three thickeners will remove over 95 percent of the solids from the wastewater. The recycling system will, of course, finally eliminate the discharge of solids to the canal. Excavation is completed for the thickener, a 70-foot diameter concrete settling basin and piping is being driven. The thickener is expected to be completed in 1969, with the recycling system to be completed in 1970.

MR. STEIN: Could we have the month on that?

MR. BROMAN: The 31st of December 1969, June 30th of 1970 for the recycling phase of the system.

MR. STEIN: Thank you.

No. 12 - Excavation and piling for
blast furnace area thickener

C. Broman

Terminal Lagoon

The fourth project is a terminal treatment lagoon which will be constructed adjacent to, and in series with, the existing lakefront scale basin. The lakefront scale basin acts as a secondary settling basin for separation of solids and oil. It receives the wastewater discharges from the primary settling basins at the 11 hot rolling mill operations.

The new terminal lagoon will assure the removal of any residual settleable solids and floating oil. The concrete lined lagoon will cover more than 4 acres, and will provide approximately 2-1/2 hours detention time for the expected 100,000 gallons per minute flow. The equipment will include 200 foot oil skimmers, several smaller oil recovery units, plus piping, pumps, tanks and scale recovery facilities. Site clearing is now under way. The site has been used for storage of ore, which is now nearly removed, and excavation and construction will proceed immediately. Completion is expected in mid-1969 or June 30 of 1969.

- - -

With the completion of these projects our wastewater control treatment program will be completed substantially in accordance with the schedules submitted and approved by the State of Indiana. One additional project which should be mentioned is a large lagoon to be constructed on the lakeside north of the new hot strip mill. While not presently intended as a treatment facility, this north lagoon will serve as an insurance or emergency facility to which wastewater may be diverted in the event of a pipeline break, equipment malfunction, or similar emergency. A part of the lagoon, a small basin, has been completed and final completion is scheduled for 1970. And I believe that is June 30, 1970.

MR. STEIN: All right, fine.

MR. BROMAN: I now turn to an evaluation of our accomplishments to date. As I believe this brief summary demonstrates, The Youngstown Sheet and Tube Company has been proceeding in good faith in its program to control the quality of its wastewater discharges. The acidity and dissolved iron contaminants from the spent pickling solutions noted in the 1965 FWPCA survey have been 100 percent controlled. Facilities have been installed and arrangements made with the city of East Chicago to control the phenolic coke plant wastewater contaminants noted in 1965. Although, as previously mentioned, the unexpected deficiency in the pumping system revealed by actual operations has prevented 100 percent efficiency, it is expected the installation of replacement pumps will cure the coke by-product waste problem.

The remaining problems are oil and suspended solids, which are among the most difficult from a technical viewpoint. It must be remembered that we did not start from scratch in 1965. As noted earlier, scale pits and oil recovery systems had already been installed which removed the bulk of the oil and suspended solids from our discharges. The problem we faced in the late 1960's was how to remove the remaining fraction of these contaminants from our discharges to bring them within the standards then adopted.

For many reasons, including variations in operating levels and changes in operating practices, it is difficult to develop precise and meaningful figures as to reductions in waste loads accomplished by the facilities completed in the last few years. According to our best estimates the facilities completed since 1965 have effected a further reduction in suspended solids since then of about 42 percent and in oil of about 35 percent.

Actually, our recent samplings indicate reductions even larger than that, but these may have been influenced by a lower level of operations.

The filtering system at the continuous buttweld pipe mill scheduled for completion this month will further reduce the oil and solid load in our wastewater. It is too early to estimate how much of a reduction in the total waste load this facility will accomplish, but it is expected to be significant.

MR. STEIN: Don't you have any guess on that at all?

MR. BROMAN: Not this one. This is a tough one.

MR. STEIN: No, we are not pushing. You see what we are dealing with here, this is the critical date--I mean if you go along with what we have been doing here. In other words, when we go back to the Secretary with something, the question he is going to ask:"Well, what have they done by the end of 1968, the date that I signed off on?" And if at all possible, I would like to see if we could have something like that so that----

MR. BROMAN: I have a summary in which I did include this particular item, because this is a difficult one.

MR. STEIN: All right.

MR. BROMAN: By the end of 1969, or within a year from now, when all of the projects now under construction have been completed, except for the second phase of the blast furnace area project, the oil control program will be fully completed and the solids will be reduced by approximately 95 percent over that reported in 1965.

Although the amount of money spent does not necessarily equal the amount of achievement, it is at least some indication of whether a sincere effort is being made. I think it is significant that since 1965 the Company has spent approximately $12 million on its water pollution control program, 60 percent of the estimated $20 million required.

POSSIBILITIES OF EARLIER COMPLETION

The Indiana Stream Pollution Control Board asked us to discuss the possibility of earlier completion of our program. Of the four uncompleted projects, one will be completed this month. The other three projects are now in actual construction, and the time of completion depends almost entirely upon the time required for the construction work.

While we fully intend to do our best to get the work done as rapidly as possible, we don't hold out much hope of completing the work significantly earlier than projected. The manpower problem is a serious obstacle to any hoped-for acceleration. More than a year ago the Indiana Board asked if it were possible to use a second and third shift to speed up construction. As we told the Board then, and it remains true today, the shortage of qualified crafts in the East Chicago area is such that our construction programs are not being manned adequately even on a single shift basis.

I think it appropriate to note here that the construction phase is usually the shortest part of a project. The really important work precedes the construction phase. You gentlemen know, of course, that we can't order a pollution control system out of a catalogue; each system must be designed and engineered to meet a specific set of problems in a given location. Design and engineering are complicated in this field because of the many demands placed on the few qualified technical people available, and the lack of a fully developed technology to clearly solve the many practical problems that arise in designing and building control installations.

Another critical problem for most older steel plants is space. It is especially critical for Youngstown, since we literally have to make our own land. The greater part of our plant today is on land reclaimed from Lake Michigan. This directly affects the north, or "standby," lagoon for the hot strip mill area, since it will actually be created by filling in a portion of the lake within the breakwater. The space problem also directly affected construction of our terminal treatment lagoon at the lakefront scale basin, since the location selected had been part of our ore yard. Fortunately, a planned extension of our ore yard made space available for the lagoon. But the ore yard extension itself was to be built partly on lands not then filled, so the space problem persisted.

In our original planning for the No. 1 and No. 2 tin mills, and the No. 2 sheet mill, we were thinking in terms of a separate facility for each mill, or three in all. As we got deeper into the planning and design of these facilities, it became apparent three separate facilities were not the answer, and we went to the single facility serving the three mills which is now under construction. One of the principal reasons for going to a single facility was the difficulty of finding appropriate locations for the three separate facilities.

One development affecting the steel industry is the recent drive to control air pollution. Ironically, solving an air pollution condition often substitutes a water pollution problem, since water sprays are used to cleanse the air in many cases. In conjunction with the air pollution control facilities recently installed at our No. 2 open hearth shop, we designed and built the closed wastewater treatment system mentioned earlier. Literally, we have to run fast just to keep from losing ground.

In setting timetables for completion of our program we tried to set dates which we thought were realistic, rather than trying to set overly optimistic dates. Our schedule was approved by the Indiana Stream Pollution Control Board, and I'm pleased to say that to date we've been able to meet our completion dates as promised, and we fully expect to meet our schedule on the remaining work. Attached to our printed report are bar charts showing the time schedule of our program.

SUMMARY

To summarize, The Youngstown Sheet and Tube Company is proceeding on schedule in its water pollution control program.

Projects to control pollutants other than oil and solids have been completed. Projects have been completed or will be completed this month which will reduce the waste loads of oil and solids by more than 35 percent and 42 percent respectively from the 1965 levels. By the end of 1969 projects now in the construction stage will complete the oil program, and will result in an estimated 95 percent reduction in the solids load. 1970 will use the completion of the recirculation system at the blast furnace area which will complete the solids program. Also scheduled for completion in 1970 is a lagoon which will afford insurance against possible emergencies in the new hot strip mill area.

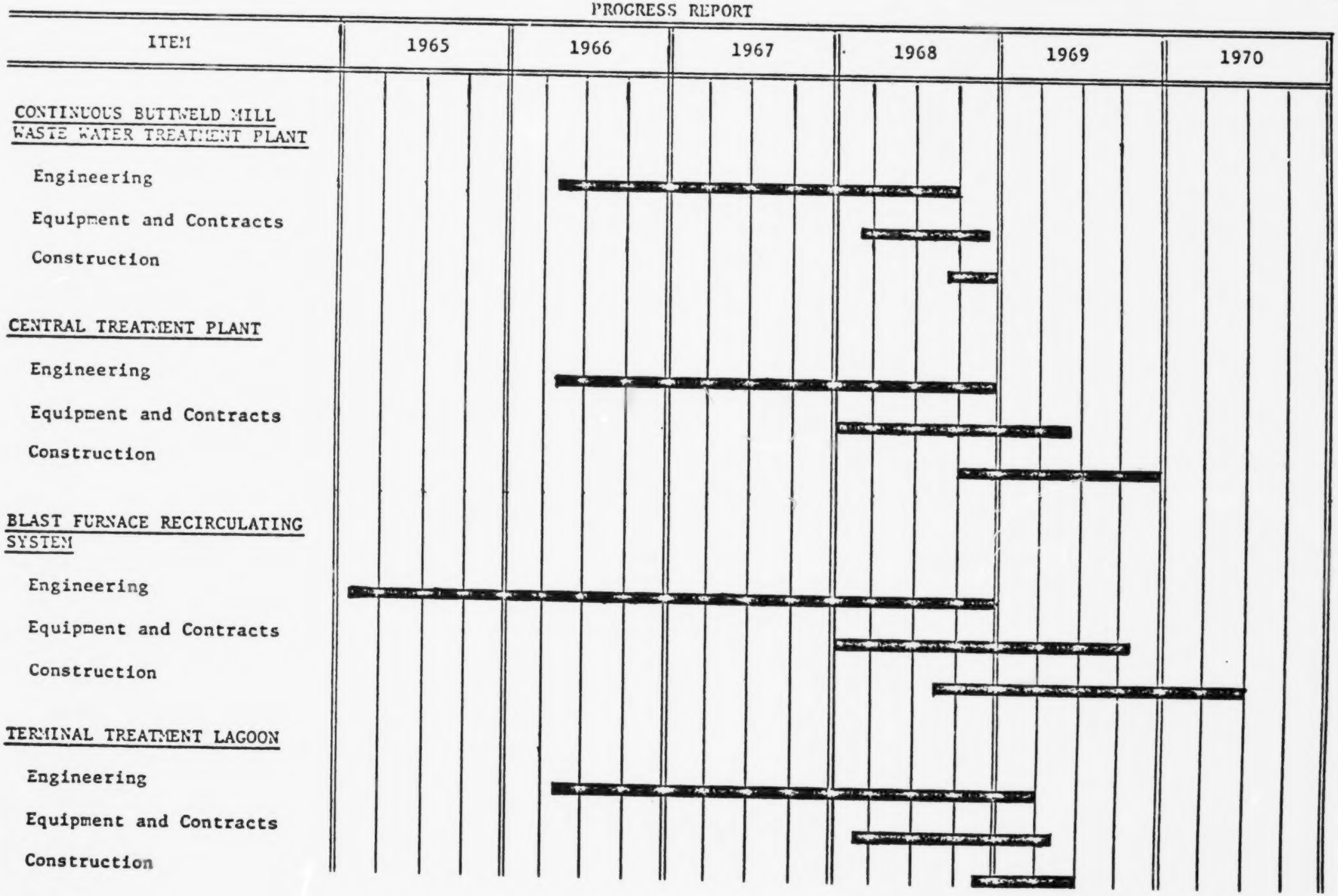
We intend to complete the remaining projects as quickly as possible and are confident we can do so within the schedule approved by the Indiana Stream Pollution Control Board.

Thank you.

INDIANA HARBOR WORKS
WASTE WATER CONTROL FACILITIES

December 6, 1968

PROGRESS REPORT



MR. STEIN: Let me ask you just one factual question before we throw it open.

In your summary you said that your work this month will reduce oil loads by 35 percent, solid loads by 42 percent from 1965, by the end of 1969 you will have an estimated 95 percent reduction in the solids program, and you will complete the oil program but you don't have a percentage for that oil. Do you want to--

MR. BROMAN: Well, 95, I would say, to 100 percent completion of the program.

MR. STEIN: Yes. Could you give a figure compared to that 35 percent? How much of the oil will be reduced?

MR. BROMAN: That would be difficult for me to say. Our program that we designed to meet the criteria will be completed. I think that is about as best I can say.

MR. STEIN: In other words, you are not going to have any discharge of visible oil, substantial discharge of visible oil?

MR. BROMAN: I think the best way that I can say that--

MR. STEIN: Well, that is the criteria.

MR. BROMAN: Well, then, we would meet the stated criteria.

MR. STEIN: All right.

Yes.

DR. BORUFF: Mr. Chairman.

MR. STEIN: Dr. Boruff.

DR. BORUFF: If I understood you correctly, your terminal lagoon is the last thing that you are going to construct. Inasmuch as the land is available, why not put it into operation and let it do a less efficient job than it would do terminally but contribute to your overall efficiency in the meantime?

MR. BROMAN: The terminal lagoon will be--we have started on it now and it will be completed by June of 1969. The last project in our program will be the recirculation of the blast furnace system. But prior to that we will have installed a third clarifier, which will be completed by the end of 1969 and then we will proceed from there to complete recirculation.

I think the order in which we are going is getting us the greatest efficiency we can get.

MR. STEIN: Mr. Klassen?

MR. KLASSEN: I was interested in your

recital of accomplishments between 1949 and 1965, and I wonder how many or how much of the waste treatment construction prior to this Conference was built primarily to eliminate water pollution or what portion of it was built for financial return of recovery or saving?

MR. BROMAN: I couldn't answer that.

MR. KLASSEN: Well, how many major production units, then -- I am not talking about waste treatment, but steel production or whatever production units -- have you built since 1965? Any major ones, like the buttwelding?

MR. BROMAN: The 84-inch hot strip mill was completed since 1965.

MR. KLASSEN: And your buttwelding?

MR. BROMAN: No, the buttwelding had been for sometime.

MR. KLASSEN: Then it follows, of your new production units, apparently you had labor for those, that were built, how many--I hope all--of the new production units have treatment facilities now in operation?

MR. BROMAN: All.

MR. KLASSEN: All.

MR. BROMAN: Any new facility will be in

operation.

MR. STEIN: Are there any further questions?

MR. POOLE: I just want to respond a little to Mr. Klassen's question. The inference was, and it has been made repeatedly over the years, that nothing has been done in Indiana until this Conference started in 1965, and I think our original report indicated--

MR. KLASSEN: I didn't infer that, Mr. Poole.

MR. POOLE: --and I can't remember the exact figures, but it was somewhere in the neighborhood of $70 to $75 million had been spent by the industries before that date and about a like amount by the cities, either spent or committed, because some of the city programs were under way when we started.

So this all didn't just come about by throwing something in with the new production facility nor did all of it come about as a result of the graciousness of all the companies over in Indiana.

MR. KLASSEN: Let the record show that I didn't infer that nothing had been done (laughter). But I believe also, unless we get carried away with the magnanimity of these companies, I think all during that time they were paying dividends to their stockholders.

MR. STEIN: Mr. Klassen, I think we both know that things were happening in Indiana before 1965, because we both went to the 500 before that date.

MR. KLASSEN: This is right.

MR. STEIN: Mr. Broman, I want to say that is a very excellent and complete report and an accurate statement.

I may be repeating this tomorrow, but before you go home with a misimpression, I think you have to take what we are doing here in perspective. I think the issues are very clear. We are probably in the middle right now of the biggest industrial and biggest combined municipal-industrial cleanup that we may have had in all these cities and industries here--certainly, to my knowledge, one of the biggest industrial cleanups.

If you look at the box score; if we just take the entities that have gotten to the batter's box and what they have done, we have a pretty, pretty high level of compliance. And I will say that if we take this situation and look at it again and again, we will find that probably the record of achievement here in terms of compliance is as good or better than I have seen in most cases. It is hard to judge because this is as complicated a case as we have had. Some of the cases have been simpler, but this stands up with any.

There is another fact that we should realize and this comes from the Conferees representing all the jurisdictions--both States, the Sanitary District, the Federal Government, the representatives of the industries or the cities. As I see it, the issue here is no longer whether they are going to clean up and put in the remedial facilities. Everyone is committed to this. The issue is when. I don't wish to single out or make a special point of the Indiana industries. Although, Mr. Poole, they have given the full report--those that have not met the date quite, and we have Youngstown, U. S. and Inland, which have demonstrated by the details of the plans and the kind of money they have spent that they mean business. We are not just having a smoke screen or a facade; we are going ahead. So the only issue that is facing us is when we are going to clean up and this is rather difficult.

Another point, of course, when you get down to what my girls call the "nitty-gritty" in this kind of business, it always gets down to precisely what they are going to put in and when they are going to do it. There is no other way of doing this than going down the rollcall of the industry, going down plant by plant, installation by installation and almost pipe by pipe. I think we have that and we have a full response from the industries so we can make a comment.

Are there any further comments on that?

If not, we have had one man who we called this morning who has been waiting here all day, E. Eugene Minney of the Indiana Izaak Walton League, and I would like to call on him now for his presentation.

Mr. Minney.

STATEMENT OF E. EUGENE MINNEY
WATER QUALITY TASK FORCE OFFICER
IZAAK WALTON LEAGUE OF AMERICA
GRIFFITH, INDIANA

MR. MINNEY: Mr. Chairman, members of the panel, ladies and gentlemen.

My name is E. Eugene Minney and I represent the Izaak Walton League of America, Indiana Division.

E. E. Minney

I am Chairman of the Air and Water Quality Task Force of the Indiana Division and also on the National Committee for Clean Water.

I would like to commend all of you for the glowing reports we heard here today. I feel like a lamb before the lions here. I hear of all these millions of dollars being spent and how the lake is going to be cleaned up. It just overwhelms me, almost to tears.

But before I go any further, Inland Steel made a statement today that the Indiana Division had presented them with a plaque commending them on their efforts to clean up the water situation. Well, I want you to know that there wasn't anyone grinding an axe there, because after the hearings last March a gentleman from Inland Steel called me and asked me if our group would like to tour the Inland works. And like the publican in the Bible story, when I got there he didn't say, "I am glad I am not like those fellows over there." He said, "Come on in and look at the mess we have got and look what we are trying to do to overcome it."

This kind of open-door policy was something unheard of before, and so at the Denver convention, after three days of haggling, because, you know, a full-fledged conservationist just hates to give anyone credit for anything, they decided to give them a plaque and this is the reason.

So as I say, I work for Blaw Knox. Our State president works for U. S. Steel in the Gary Works, by the way. So no one was grinding axes.

And once again I want to commend Inland Steel for their open-door policy. And I would like to thank Mayor Nicosia for his invitation today for the Izaak Walton League to tour his facilities in Inland Steel.

You know, gentlemen, we will never, never come to an understanding unless these big companies come out of the holes that they are in and understand and realize that they are serving the public and that the public depends on them. All they are interested in is the date and the time and when they are going to get this. They are not interested in what is going on otherwise.

When you get down to Lake Michigan in the Calumet area you see scenes like this (holding up photograph), Coho dead all over the beaches.

A youngster ankle deep in grease (holding up another photograph) in the East Chicago City Park. And oil. No wonder Mayor Nicosia is alarmed and doing something about it.

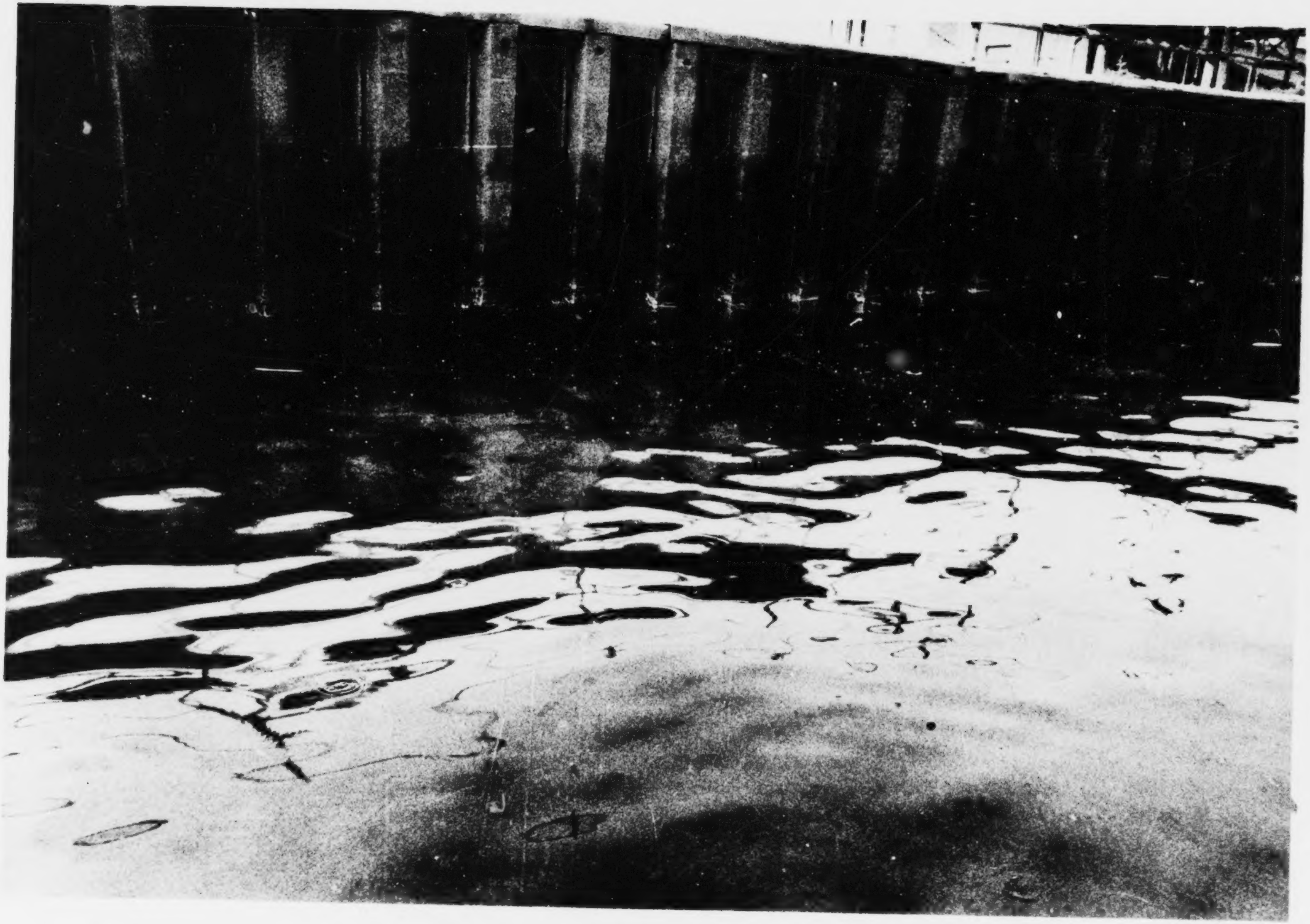
Here is a scene on the Grand Calumet River taken September 14th (holding up another photograph). You all know what this is. It isn't snow.

These (another photograph) are oil bubbles taken in the Harbor Canal.

Here (another photograph) is Mr. Bob Bowden, Chief of Surveillance for the Federal Water Pollution Control Agency, at the Indiana Harbor Canal, Lake Michigan.

Here (another photograph) is a good example of water. I don't have to tell you that the dark water contains life-giving materials and what this (indicating) contains, and this is water from the Canal. It contains no life whatsoever, has no organisms of any kind. I am sure this gentleman here can testify to this also.

These pictures were taken by the Chicago Tribune and are available at their offices if anyone would care to get them. But I am sure all of you can just visit these places and take your own pictures.



E. E. Minney

All the time that I heard things going on today I wondered why one of the most atrocious of all pollutions wasn't mentioned hardly at all and that is thermal pollution. This past week the Izaak Walton League, Indiana Division, hired an airplane and we took infrared pictures of the entire waterfront from Michigan City to the Illinois line. This new technique is very revealing, gentlemen. If there is a 10-degree difference in water temperature it will upset the entire balance of the lake. Fish get lazy and refuse to spawn. It will increase algae.

I saw a new cooling tower at the Inland Steel Works. I saw maybe three or four in that whole stretch from Michigan City to the Indiana line.

We have a scuba diving club working for our organization, members of our group, who have been diving off of the shores of Lake Michigan and what they have found is almost unbelieveable. I cannot state what it is now because we haven't had any cameras that we can take pictures under water with to prove our case, but they are on their way. When we get the pictures, we will be glad to give them to the news media.

Another thing that amazed me to no end

was how this Board could come up with terminology like non-visible oil in the water. What in the world kind of terminology is this, non-visible oil in the water? I can buy mineral oil in the drug store that is almost as light as water. And I want you to know, gentlemen, that the public, the conservationists, are not going to stand for anything less than water that can be consumed by a human body when it comes back into our lake and our streams. We are not going to stand still until we get clean water coming back in, not water that you can't see the oil in.

We have wildlife, fish, one of the great economies of our Great Lakes. They should be able to live in that water and prosper and be healthy.

So I want to ask this Board if they will reconsider the terminology of non-visible oil in the water. Lord God Almighty, how about cyanide, can you see it in the water? How about other things, can you see it in the water? No. The terminology that we want in this rule and regulation is water that can be consumed by a human when it comes back into our streams and into our lake.

I want you to know, though, that we really appreciate the hard and diligent work that the industries are doing. We would like you to welcome us into your midst. We feel that the tax setup is not fit for the amount of money that you are investing. We think that there should be legislation. We will help you. We will fight for you.

But I ask you, gentlemen, ask your companies to come out of the hole and invite us in, show us what you have so we can tell the public, so that we know what is going on, so there is nothing hidden. I don't think that is asking too much.

Mr. Chairman, I would like to say one more thing, if you will convey the best wishes of the Izaak Walton League to Secretary of the Interior Udall for the wonderful work he has done. We say God bless him and we wish him Godspeed. If the man that takes his place does as good a job, we will be very, very, very fortunate indeed.

And I would also like to say thank you to the news media for being impartial and for printing the truth, especially the Chicago Tribune with the Save Our Lake program.

Thank you.

MR. STEIN: Thank you.

You know, as the steel companies are progressing in this field, what they appear to be doing is replacing the open hearth with the open door (laughter).

MR. KLASSEN: There is one point here that I would like a little clarification on. He said water that can be consumed by humans. In other words--and this is just an informational point--in other words, water in the lake that you can drink?

MR. MINNEY: Mr. Klassen, you know that is what I meant. I couldn't mean anything else but that.

MR. KLASSEN: This is what I thought you meant.

MR. MINNEY: Why, certainly.

MR. KLASSEN: In other words, so you can go out in the lake and take a drink of water.

MR. MINNEY: Oh, well--

MR. KLASSEN: No, this is what you said.

MR. MINNEY: I said water that is returned to the streams and to the lakes should be able to be consumed, right.

MR. KLASSEN: In other words, every effluent out of every discharge into the lake you can drink, is this what you said?

MR. MINNEY: That is what I feel, conservationists feel it should be pure.

MR. KLASSEN: All right.

MR. MINNEY: In this day and age, sir, when you can fly to the moon and--

MR. KLASSEN: I am not talking about flying to the moon. And this is typical of the Izaak Walton League. You are talking generalities.

MR. MINNEY: No, sir.

MR. KLASSEN: You have answered my question.

MR. MINNEY: Thank you, sir.

MR. STEIN: Are there any more comments or questions?

You know, I might say to the League on this operation and for all the conservation groups, before you critize the notion of visible oil you might try with your own scientific staff and your own staff to come up with a suggested alternative. The reason I think this Board has taken visible oil as one of its criteria is this was the best and most equitable requirement we could think of in controlling oil. If there is anything better, I would like to know it.

And by the way, the President of the Izaak Walton League, Ray Haik, the Executive Director, Joe Penfold, are fully conversant with this problem. I talked with them many, many times. So far I haven't heard of anything better.

If there is anything better, I am sure I would like to hear it. And when you ask us to reconsider something, I hope you will give us an alternative.

MR. MINNEY: May I say, sir, that I am going to try. I will try my best.

MR. STEIN: All right, thank you.

MR. KLASSEN: I might also say for the record, we took this exact wording from the Federal Guidelines for Clean Water, with which we agree, and I might say it is my understanding that the Izaak Walton League also subscribed to this wording.

MR. MINNEY: You are sure of that, sir?

MR. KLASSEN: I am quite sure of it.

MR. MINNEY: You are sure, sir?

MR. KLASSEN: Not maybe the Indiana chapter. (Laughter.)

MR. STEIN: Are we all set?

Tomorrow we are going to be moved to Parlor I, which I understand is on the same floor.

If there is nothing more, we will stand recessed until 9:30 tomorrow morning.

(Whereupon, at 5:15 p.m., an adjournment was taken until 9:30 a.m., Thursday, December 12, 1968.)

- - -

MORNING SESSION

THURSDAY, DECEMBER 12, 1968

(9:30 a. m.)

MR. STEIN: Let's reconvene.

We have had a couple of participants who have been waiting here all day yesterday and we are going to switch a little bit.

I probably can outline the schedule for you this morning, and my best estimate is that we should be through sometime about noon today unless something comes up. Now, if anyone feels they have something to say, and I haven't outlined the schedule for them, they should either let their State representatives know or the District representative and the Chairman, and we will see that you are heard.

This is today, I guess, sort of like the two ladies I heard talking in the Loop in Chicago about their vacation this year. One lady asked the other matron, "Where are you going?"

And she said, "Well, last year," she said, "I took a trip around the world, but this year I'm going somewhere else." (Laughter.)

And I think we are going to switch.

We would like to call on Mr. Vaughn of

Chicago to give us his report on the water quality.

I might say while Mr. Vaughn is coming up, we expect to hear from Mr. Vaughn, Mr. Bowden of the Technical Committee, and then Mr. Bacon of the District. If anyone else wants to make a statement, be sure you get to us before these people get through so we can make provision for you on the program.

Mr. Vaughn.

PROGRESS REPORT BY JAMES C. VAUGHN
ENGINEER OF WATER PURIFICATION, DEPARTMENT OF WATER AND SEWERS, CHICAGO, ILLINOIS

MR. VAUGHN: Mr. Chairman, Conferees and ladies and gentlemen.

This report this morning is a supplement to the report that was presented to the Four-States Conference last January and early February. The material is entitled, "Supplement to **Report on Effect of Water** Quality Deterioration on the Operation of Chicago's South Water Filtration Plant."

The material submitted herewith is intended only as a supplement to the above-named report.

J. C. Vaughn

Much of the preliminary information given in that report will not be repeated. The tables and charts have been brought up to date and some discussion of the added material will be given.

Bacterial Pollution

The average coliform bacteria per 100 ml at the South Water Filtration Plant (SWFP) intake for the period of January-November, 1968, has been tabulated on Table D-1 and plotted on Chart D-1 which are shown together in the figure. It is noted that the average coliforn of 86.0 per 100 ml is higher than the corresponding values for 1965 and 1966 although not as high as 1967. The maximum value of 2,400 per 100 ml is higher than the maximum values for 1964, 1965 and 1966 but is not as high as the maximum value for 1967.

Abnormal Pollution at SWFP Intakes

The data on abnormal oil refinery wastes odor periods for the past 18 years was brought up to date through November 1968 in Table D-2 and plotted on Chart D-2. The number of odor periods (18) during 1968 exceeds the number in 1965 and on a proportionate scale is of the same order of magnitude as 1966 and 1967. The number of odor days (49) exceeds the number in 1965 but is less than the number in 1966 and 1967. You must remember we are talking about an 11-month period here in 1968 compared to 12 months in the earlier years. A maximum threshold odor (17) exceeded the value for 1965 and is of the same order of magnitude as the value (20) for 1967.

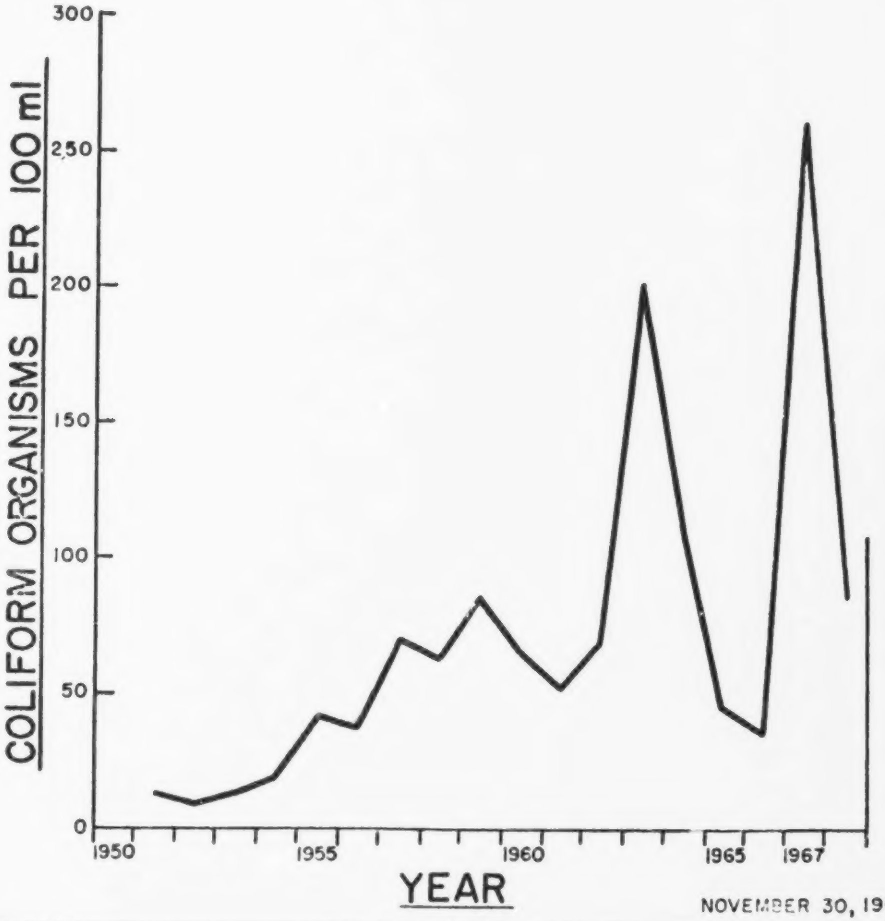
Permit me to depart from the text at this point to say that that value of 17 is now obsolete. We always try to create an environment appropriate to these conferences. Blucher and Perry brought along with them some typical Indiana water and yesterday morning we were hit with slugs in the refinery wastes at the South plant that hit a maximum threshold odor of 20 hydrocarbon and a maximum ammonia nitrogen of 0.1 parts per million and a maximum carbon dosage of 500 pounds per million gallons. As of 7 o'clock this morning we still have a 5 CH hydrocarbon, are feeding 120 pounds of carbon a million gallons. You multiply that by the 400 million gallons a day that we are pumping at the South plant and that represents in excess of 40,000 pounds of carbon, which is a considerable amount when you pay 8.2 cents a pound for it. So we hope you feel at home, particularly Perry and Blucher. (Laughter.)

FIGURE D-1

AVERAGE COLIFORM PER 100 ml
SOUTH WATER FILTRATION PLANT INTAKE
1950 - 1968

YEAR	COLIFORM PER 100 ml	
	ANNUAL AVERAGE	MAXIMUM DAY
1950		
1951	14.0	375
1952	9.7	495
1953	13.9	534
1954	20.0	959
1955	42.3	1300
1956	38.7	1400
1957	70.8	9600
1958	63.1	6400
1959	85.6	3200
1960	65.2	2900
1961	52.4	3000
1962	69.5	1700
1963	200.8	5800
1964	110.2	1900
1965	46.3	1100
1966	35.8	1200
1967	260.0	13000
1968*	86.0	2400

* THRU NOVEMBER



DEPARTMENT OF WATER & SEWERS
BUREAU OF WATER
CITY OF CHICAGO

NOVEMBER 30, 1968

TABLE D-2

SUMMARY OF "OIL REFINERY WASTE" TYPE ABNORMAL ODOR PERIODS
IN RAW LAKE WATER SUPPLY TO SOUTH WATER FILTRATION PLANT

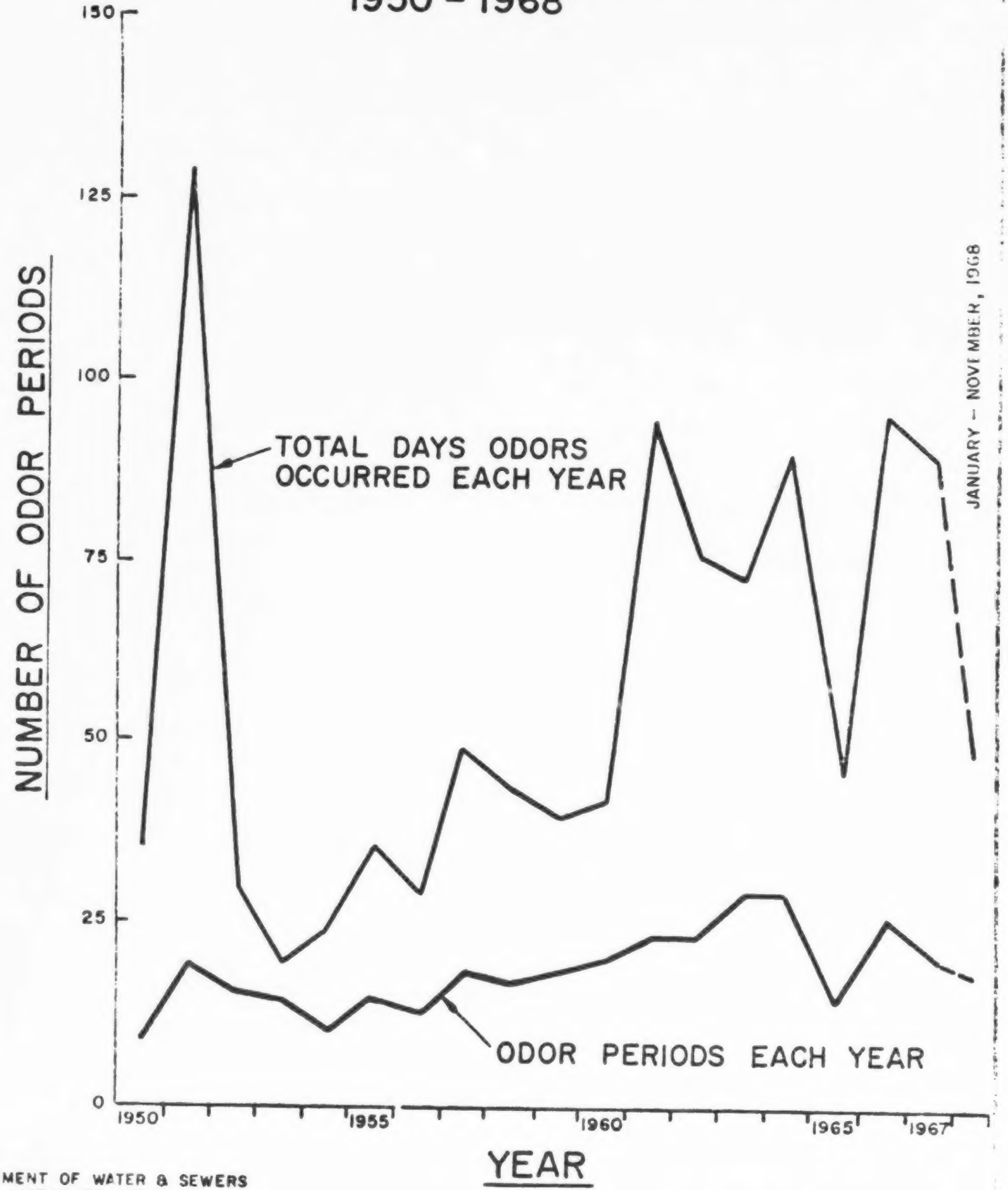
1950 - NOVEMBER 30, 1968

YEAR	NUMBER OF ODOR PERIODS	TOTAL ODOR DAYS	MAXIMUM THRESHOLD ODORS DURING PERIODS 4-20	21-50	51-100	MAXIMUM ACTIVATED CARBON DOSAGE APPLIED LB/MIL GAL
1950	10	36	6	3	1	1,158
1951	20	127	16	4	-	446
1952	17	30	16	1	-	590
1953	16	18	16	-	-	266
1954	12	23	11	1	-	356
1955	15	36	15	-	-	279
1956	13	28	12	1	-	415
1957	18	49	18	-	-	325
1958	17	43	16	1	-	503
1959	19	40	17	2	-	712
1960	21	42	20	1	-	324
1961	23	94	23	-	-	388
1962	23	76	23	-	-	370
1963	28	72	27	1	-	680
1964	28	89	27	-	1	745
1965	15	46	14	1	-	320
1966	26	95	25	1	-	385
1967	21	89	20	1	-	557
JAN - NOV 1968	18	49	17	1	-	411

FIGURE D-2

ABNORMAL "OIL REFINERY" TYPE ODOR PERIODS

SOUTH WATER FILTRATION PLANT INTAKE 1950 - 1968



DEPARTMENT OF WATER & SEWERS
BUREAU OF WATER
CITY OF CHICAGO

NOVEMBER 30, 1968

J. C. Vaughn

The maximum activated carbon dosage applied (411 lb/mil gal)--you see that is also obsolete now, since yesterday--exceeded the similar maximum values for 1965 and 1966 although it is somewhat less than the value for 1967.

It is again stated that a water treatment plant must be prepared to treat the maximum demands that will be placed upon it as to quantity and quality; otherwise, an unsatisfactory water supply will frequently be delivered to the consumer.

In Table D-3, the data for January-November 1968 on maximum ammonia nitrogen (ppm), maximum activated carbon dosage (lb/mil gal), and maximum chlorine dosage (lb/mil gal) have been added. The maximum ammonia nitrogen values have been plotted on Figure D-3. The maximum ammonia nitrogen value exceeds that for 1965 and is equivalent to that for 1966 although it is less than the value for 1967. The maximum carbon dosage exceeds the equivalent values for 1965 and 1966 and as stated above, is somewhat less than the maximum value for 1967. The maximum chlorine dosage (51.1 lb/mil gal) is of the same order of magnitude as the equivalent values for 1965 and 1966 but considerably less than the value for 1967, which was 70 pounds per million gallons. All of this shows some improvement. The values are still much above those considered desirable for daily water treatment. In Table D-4 we have summarized the total activated carbon applied in lb/year. This data is plotted on Figure D-4. It is surprising to note that the total pounds (4,555,647) for the January-November 1968 period exceeds the total (4,455,273) for all of 1967. The average lb/mil gal (34) is, therefore, expectedly above the equivalent values for 1965, 1966 and 1967. This means that the odor periods were of a sustained higher average values and the contaminants more difficult to remove. The maximum carbon dosage tabulated here on this table, as mentioned above, exceeds the values for 1965 and 1966, and is somewhat less than the value for 1967. The overall picture indicates that the oil refinery wastes pollution is not significantly improved.

TABLE D-3

SUMMARY OF MAXIMUM AMMONIA NITROGEN IN INTAKE WATER SUPPLY, AND ACTIVATED CARBON AND CHLORINE APPLIED DURING ABNORMAL ODOR POLLUTION PERIODS

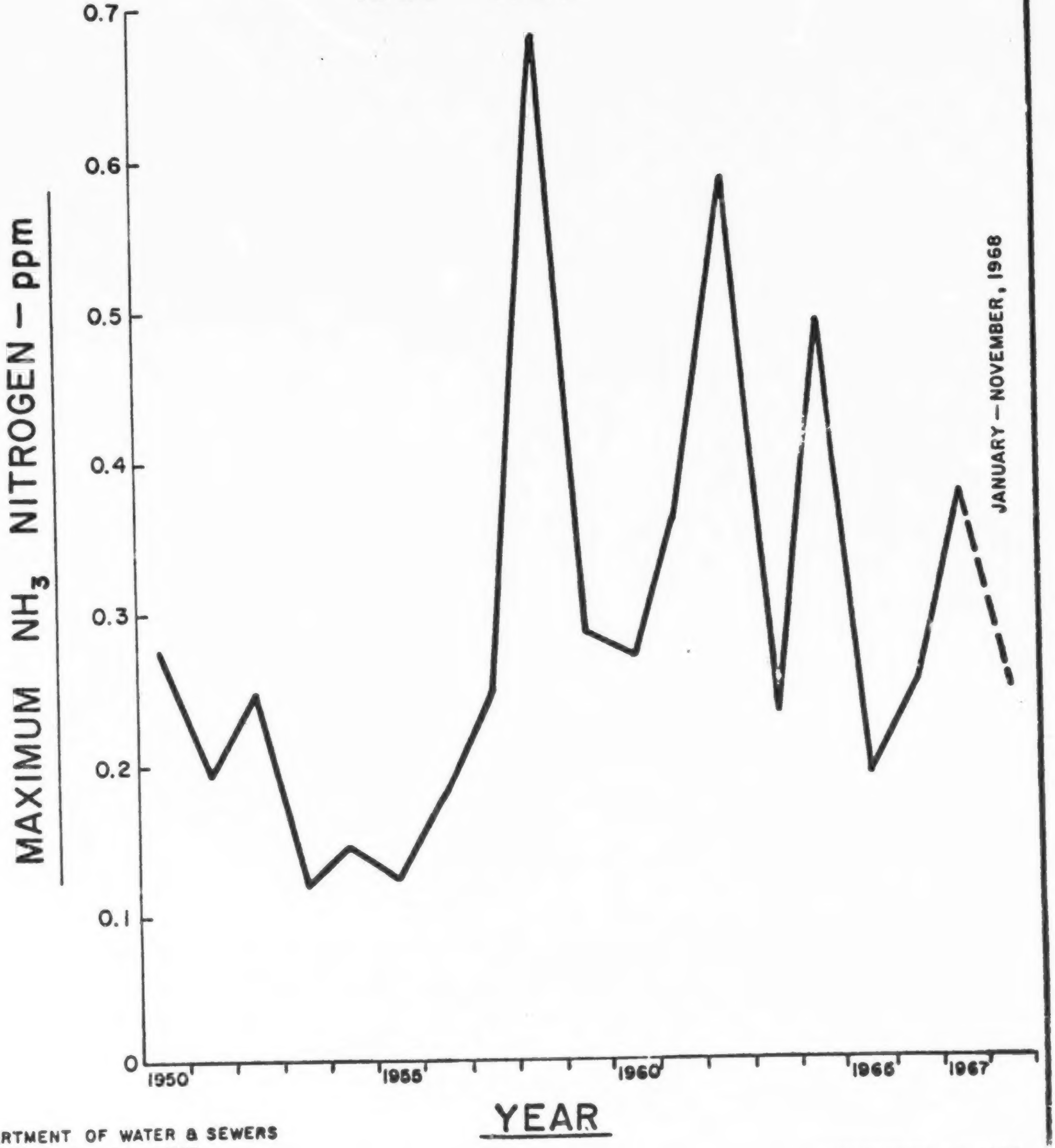
SOUTH WATER FILTRATION PLANT, 1950 - NOVEMBER 30, 1968

YEAR	MAXIMUM AMMONIA NITROGEN (PPM)	MAXIMUM ACTIVATED CARBON DOSAGE (LB/MIL GAL)	MAXIMUM CHLORINE DOSAGE (LB/MIL GAL)
1950	0.276	1,158	84.0
1951	0.196	446	45.5
1952	0.248	590	45.1
1953	0.120	266	35.4
1954	0.148	356	20.8
1955	0.125	279	24.3
1956	0.180	415	24.4
1957	0.248	325	26.8
1958	0.680	503	19.4
1959	0.290	712	24.5
1960	0.272	324	16.0
1961	0.358	388	20.3
1962	0.590	370	27.2
1963	0.230	680	42.8
1964	0.496	745	56.1
1965	0.198	320	53.1
1966	0.260	385	53.9
1967	0.380	557	70.0
JAN - NOV 1968	0.25	411	51.1

FIGURE D-3

MAXIMUM AMMONIA NITROGEN DURING ABNORMAL "OIL REFINERY" TYPE ODOR PERIODS

SOUTH WATER FILTRATION PLANT INTAKE
1950 – 1968



DEPARTMENT OF WATER & SEWERS
BUREAU OF WATER
CITY OF CHICAGO

NOVEMBER 30, 1968

TABLE D-4

SUMMARY OF ACTIVATED CARBON APPLIED FOR REMOVAL OF ODORS IN LAKE WATER SOUTH WATER FILTRATION PLANT

1950 - NOVEMBER 30, 1968

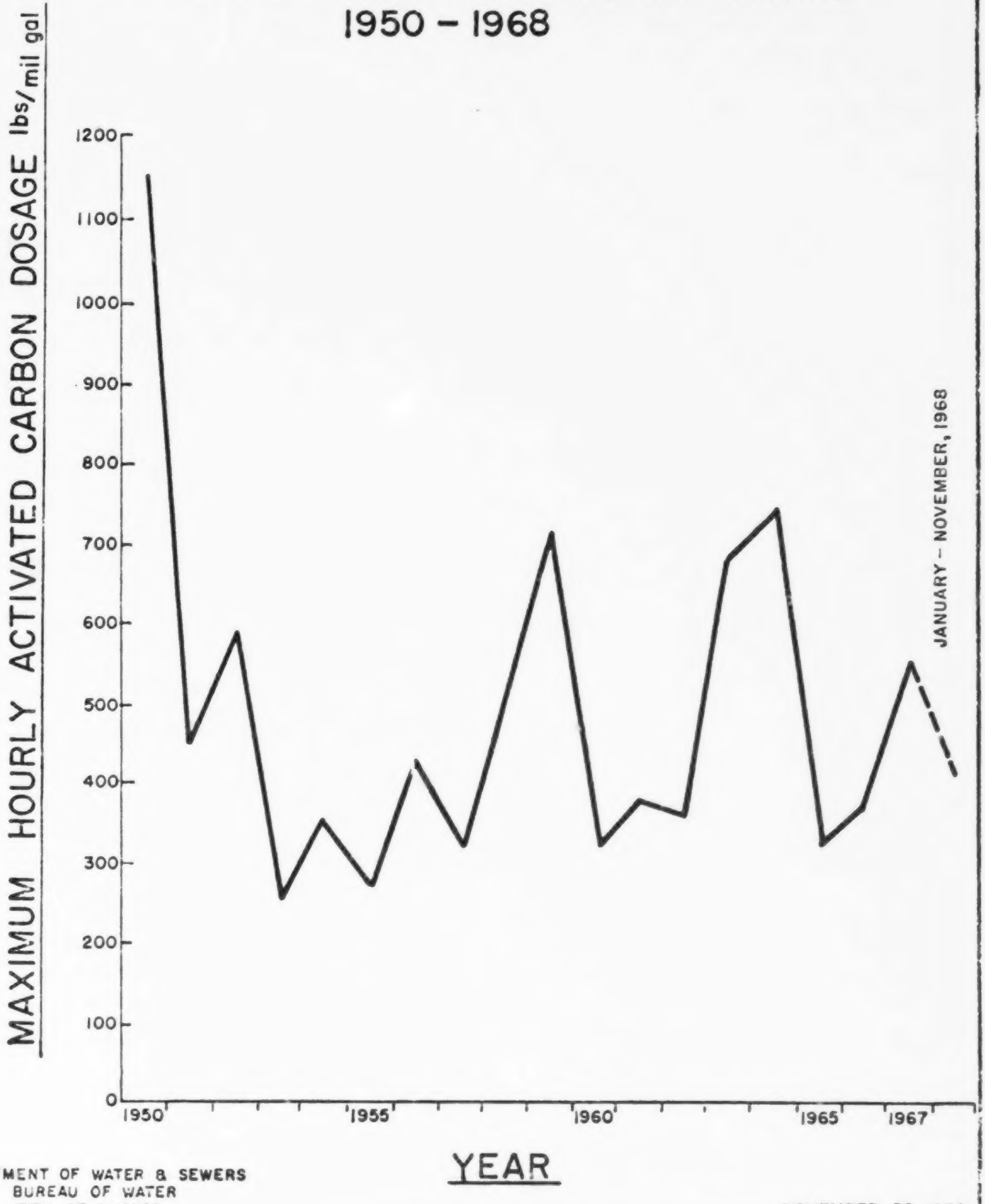
YEAR	TOTAL ACTIVATED CARBON APPLIED (LB)	AVERAGE CARBON DOSAGE (LB/MIL GAL)	MAXIMUM HOURLY CARBON DOSAGE DURING ODOR PERIODS (LB/MIL GAL)
1950	2,874,905	26	1,158
1951	3,545,552	31	446
1952	3,203,426	26	590
1953	1,775,063	14	266
1954	2,011,359	16	356
1955	2,057,781	17	279
1956	1,981,108	16	415
1957	3,032,729	24	325
1958	2,762,540	22	503
1959	3,035,509	23	712
1960	2,727,005	21	324
1961	2,632,923	21	388
1962	2,865,541	22	370
1963	3,194,443	23	680
1964	3,773,655	27	745
1965	3,094,606	23	320
1966	4,678,661	33	385
1967	4,455,273	32	557
Jan-Nov 1968	4,555,647	34	411

FIGURE D-4

MAXIMUM ACTIVATED CARBON DOSAGE DURING ABNORMAL "OIL REFINERY" TYPE ODOR PERIODS

SOUTH WATER FILTRATION PLANT INTAKE

1950 - 1968



DEPARTMENT OF WATER & SEWERS
BUREAU OF WATER
CITY OF CHICAGO

NOVEMBER 30, 1968

J. C. Vaughn

Pollution of Rivers Discharging into the Lake 1950-1968

In the basic report we reported on the value of certain parameters on samples taken from a number of points on the Calumet River, Grand Calumet River, Little Calumet River and the Indiana Harbor Ship Canal (IHSC). The location of these sampling points are shown in Figure E-1. We are most concerned with the contribution of pollutants to the water in the southern end of Lake Michigan by the IHSC and the Calumet River. Certain parameters have been plotted on Figures E-4, E-5 and E-6. In Figure E-4, the annual average coliform organisms per 100 ml are plotted for the IHSC at the Dickey Road Bridge and the Calumet River at the 92nd Street Bridge. The values for June-November 1968 have been added to the values for the previous years. There is a considerable drop-off in the value of coliform organisms in the samples taken from the IHSC at the Dickey Road Bridge. However, the average value for the 11 months of 1,568,400 coliform per 100 ml is a figure much too high for a desirable raw water. The value at the 92nd Street Bridge on the Calumet River shows a slight drop-off but has not been significant in previous years.

In Figure E-5, the average ammonia nitrogen values in ppm are plotted for the two points under discussion. Surprisingly, the average value of 5.92 ppm ammonia nitrogen for the samples taken at the Dickey Road Bridge for the January-November 1968 period is far in excess of any previously recorded value. We have no explanation for this increase in ammonia nitrogen value. It might be deduced that the efficacy of chlorination of sewage plant effluents being contributed to the Ship Canal is not as high as could be desired. Similarly, there has been an increase in the ammonia nitrogen value of the samples taken at the 92nd Street Bridge of the Calumet River. The same conclusion as to cause might be drawn.

In Figure E-6, the annual average phenol values in ppm, the same two tributary points are shown. The averages for the June-November 1968 period have been added to the plotted results of the previous years. At both points there has been a slight reduction in the phenol values. This is an acceptable improvement.

Migration of Pollution Slugs

In previous reports this migration of pollution slugs has been described in considerable detail. This problem still exists and represents a

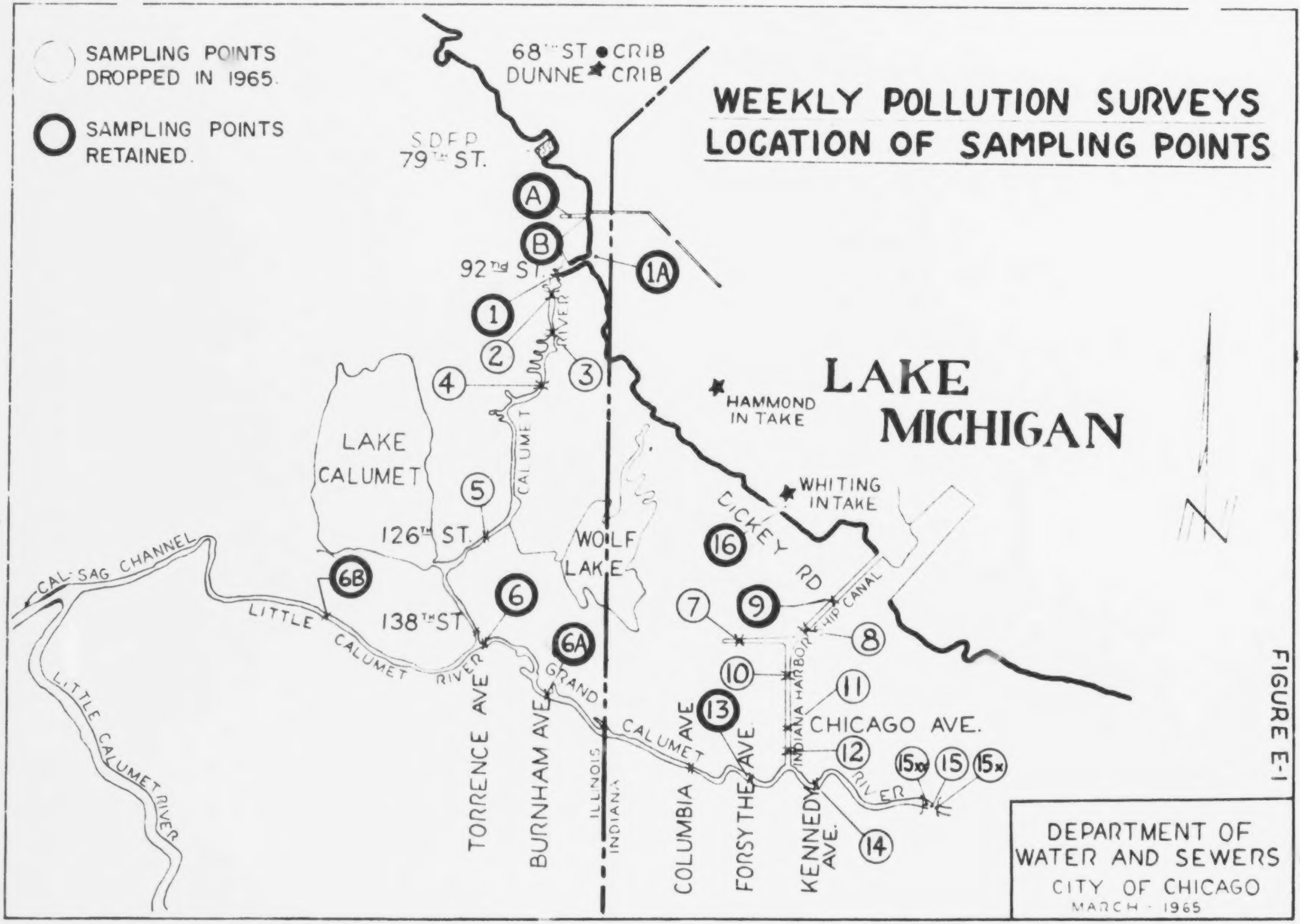
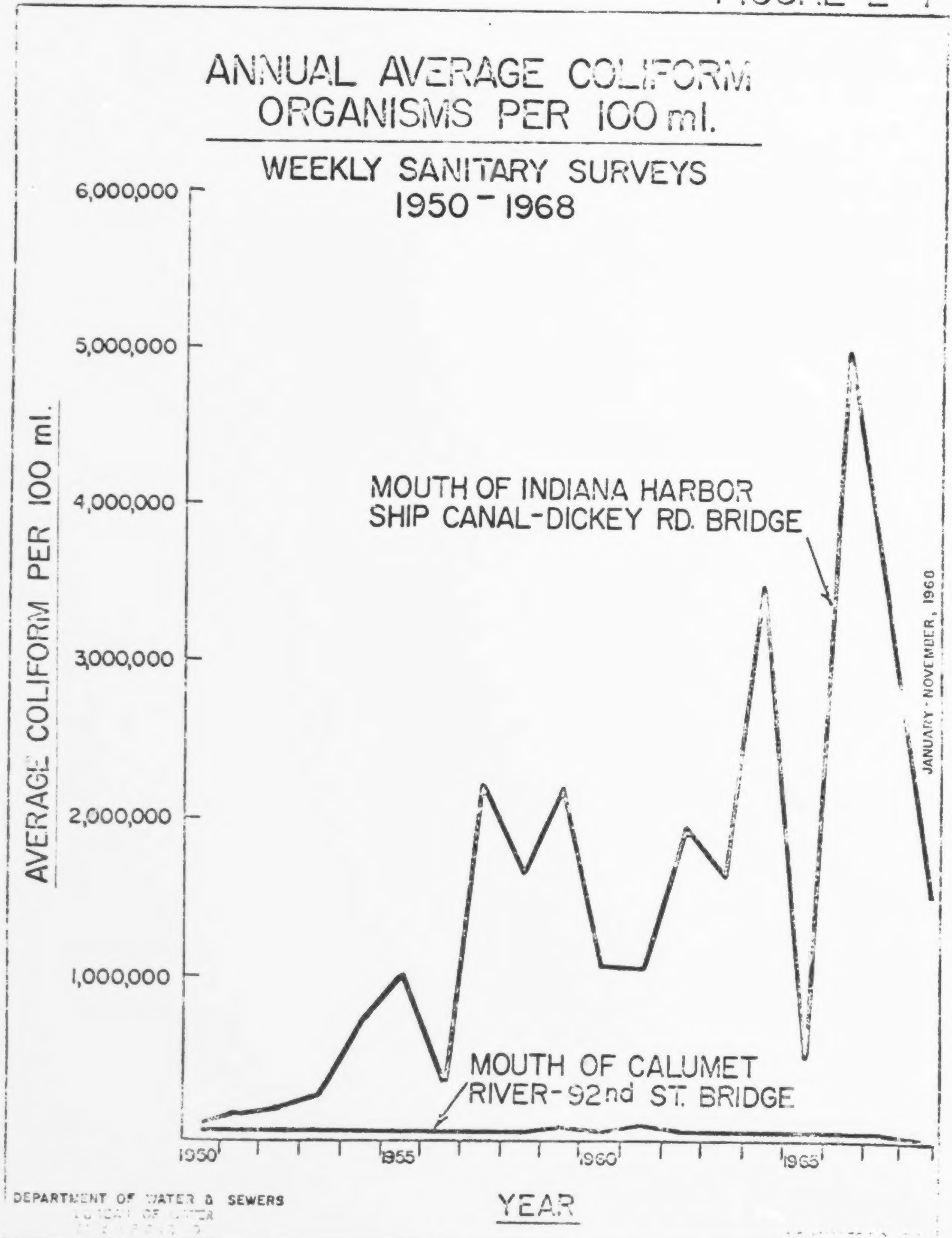


FIGURE E-1

WEEKLY POLLUTION SURVEYS
LOCATION OF SAMPLING POINTS

DEPARTMENT OF
WATER AND SEWERS
CITY OF CHICAGO
MARCH - 1965

FIGURE E-4


ANNUAL AVERAGE COLIFORM ORGANISMS PER 100 ml.

WEEKLY SANITARY SURVEYS 1950 - 1968

DEPARTMENT OF WATER & SEWERS
BUREAU OF WATER
[illegible]

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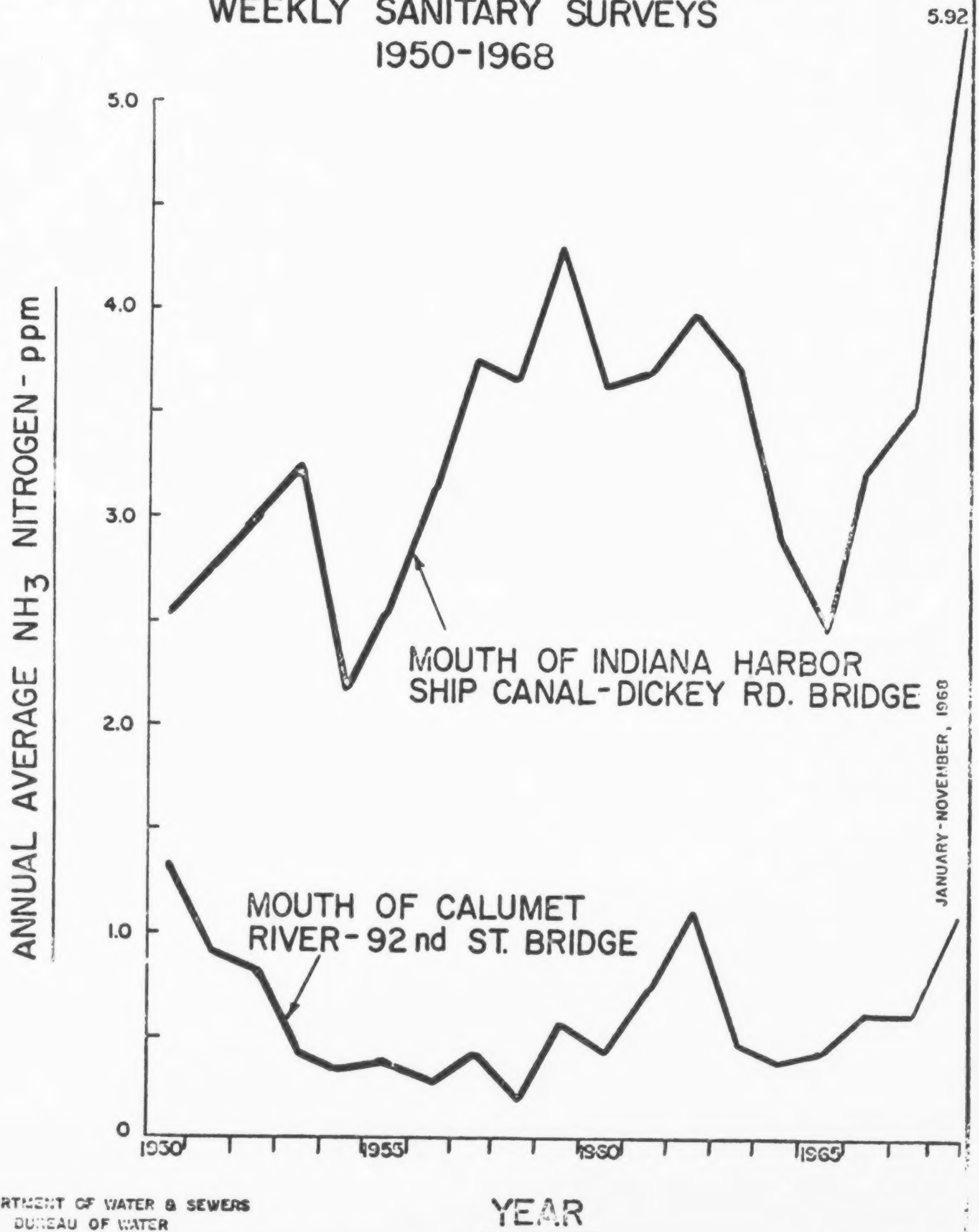
FIGURE E-5

ANNUAL AVERAGE AMMONIA NITROGEN

WEEKLY SANITARY SURVEYS
1950-1968



DEPARTMENT OF WATER & SEWERS
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CITY OF CHICAGO

NOVEMBER 30, 1968

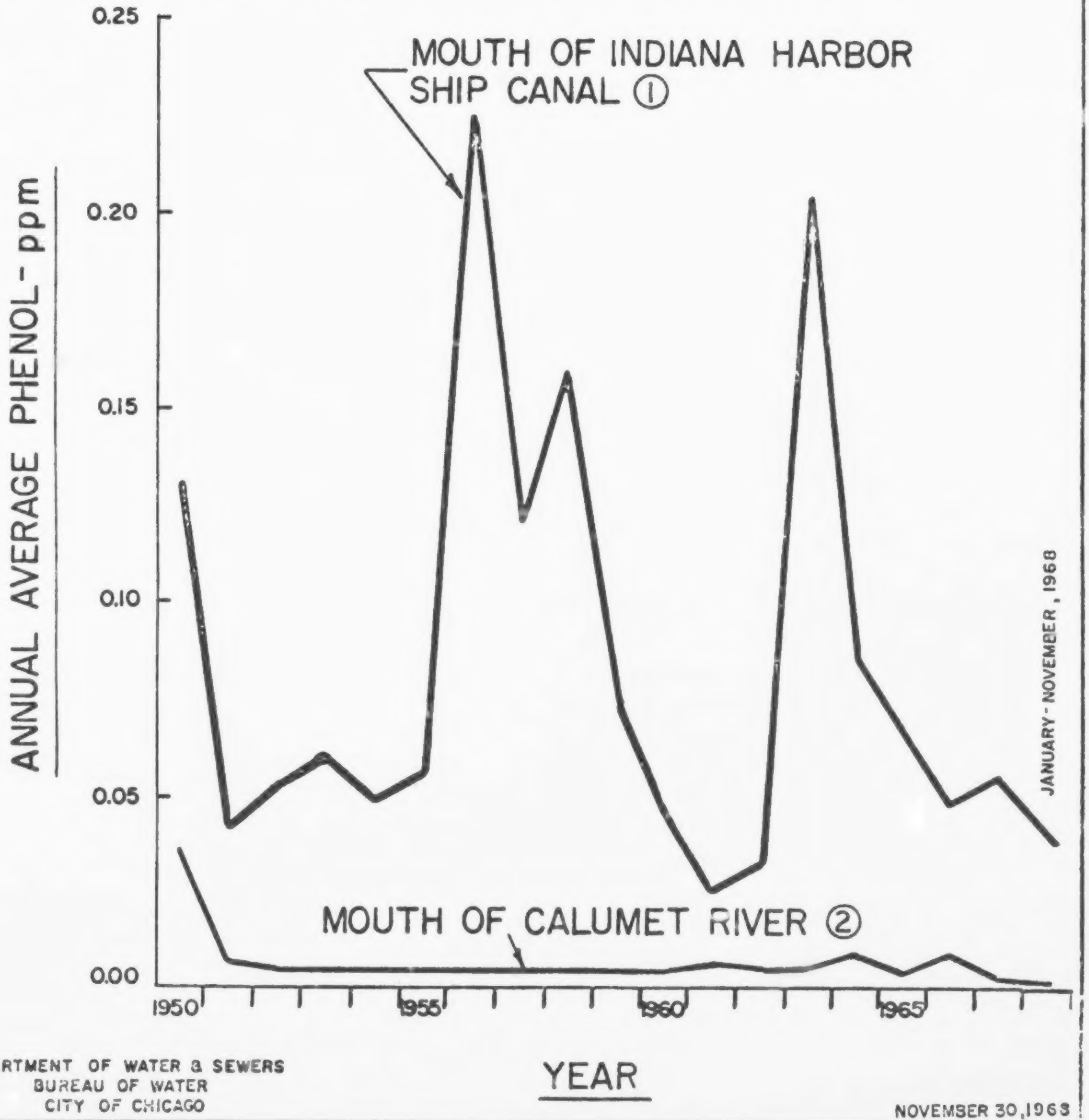
FIGURE E-6

ANNUAL AVERAGE PHENOL

WEEKLY SANITARY SURVEYS
1950-1968

① INDIANA HARBOR SHIP CANAL SAMPLING AT CANAL ST. BRIDGE (1950-1959) AND DICKEY RD. BRIDGE (1960-1968)

② CALUMET RIVER SAMPLING AT 92nd ST. BRIDGE (1950-1968)



DEPARTMENT OF WATER & SEWERS
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NOVEMBER 30, 1968

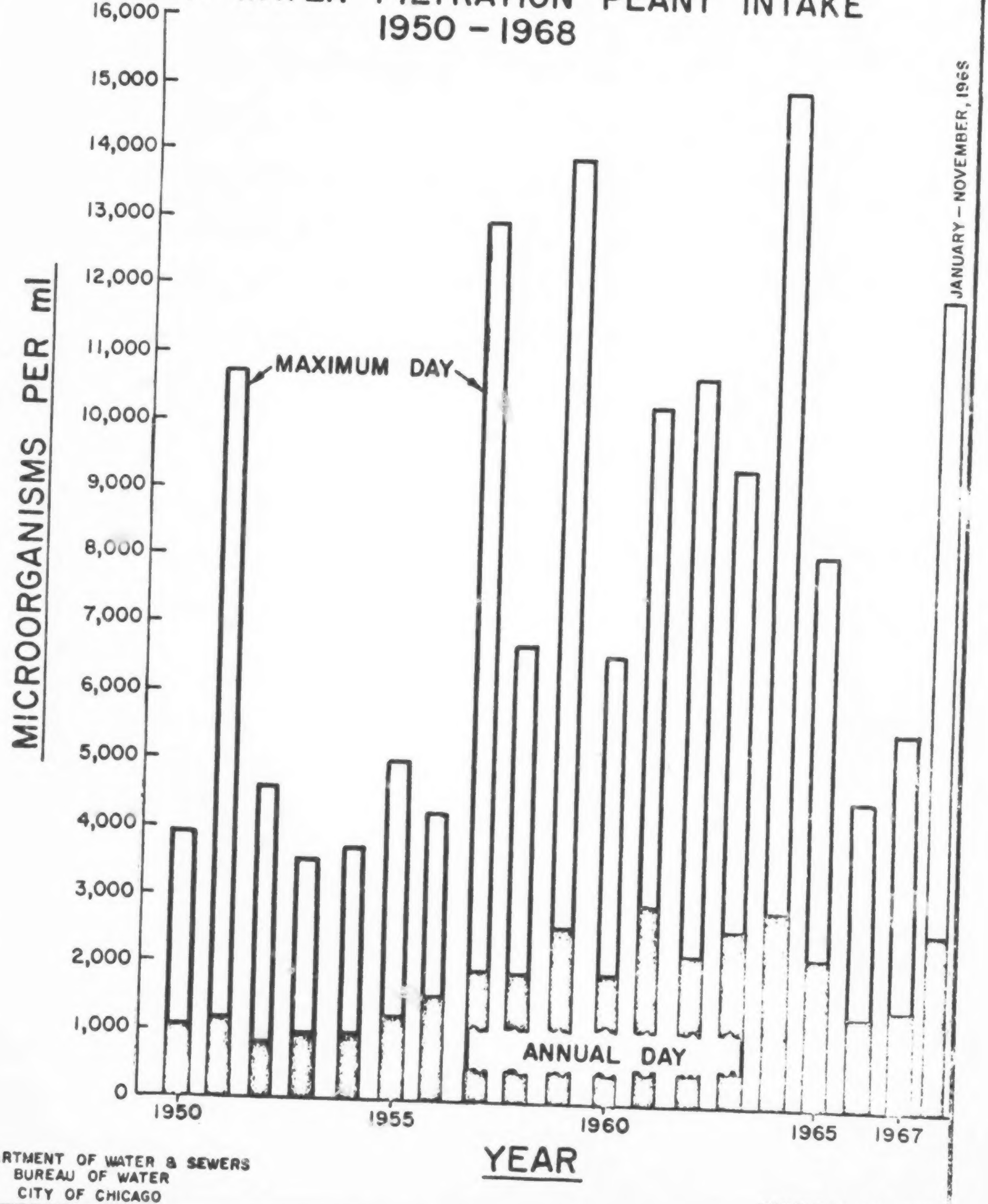
variability in the problems of water treatment that is not always predictable. Again, some of the slugs of pollution that have beset the SWFP and some of the North Shore water filtration plants have migrated to the intake of the Central Water Filtration Plant (CWFP)

Plankton Problems

The nature of the general plankton problems besetting the SWFP is described in considerable detail in the basic report. This description will not be repeated. The number of plankton micro-organisms per ml as the annual average and the maximum days are plotted on Chart H-1. It is noted that the maximum day for the January-November 1968 period is considerably in excess of any value since 1964. Similarly, the annual average for the same period exceeds any previous value since 1964. It is pointed out that these values do not indicate the breakdown count of the individual organisms. For example, during the period of June 6-18, the water had an extremely fishy taste attributable to the high incidence of Dinobryon. Neither do the values show the incidence of Cladophora. This organism has been a continuing nuisance. You remember, that is the filamentous algae that you see growing on the rocks along the shore.

FIGURE H-1

PLANKTON
MICROORGANISMS PER ml
SOUTH WATER FILTRATION PLANT INTAKE
1950 - 1968



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CITY OF CHICAGO

NOVEMBER 30, 1968

It is torn loose from the beds where it grows and gets into the intake basin and collects on the fixed screens. The hand labor required for the removal of Cladophora from the screens is excessive and is required intermittently over a period of as long as six months. Perhaps the increase in plankton nuisances may be attributed to the increase in the quantity of ammonia nitrogen contributed to the southern end of the lake by the IHSC and the Calumet River as indicated above.

Costs of Treating Polluted Water

From the basic report this statement is repeated: "Any condition requiring the use of 20 lb of activated carbon per million gallons of water or more than 13 lb of chlorine per million gallons, will be recorded as a pollution load on the plant. When the carbon feeds are increased to 40 lb/mil gal, more coagulation is required to aid in the settling out of the carbon. After a study of plant operating data, it was concluded that, except in periods of high turbidity, any coagulation dosage of over 90 lb/mil gal may be charged to the carbon requirement, therefore, to the pollution load." In the basic report, we used the statement "some maximum days of usage" meaning those days at the SWFP in which the total lb of activated carbon feed amounted to 30,000 lb or more. The number of days in which this occurred for each of the 11 years, 1958 through 1968, meaning through November 1968, are listed in Table I-1. The total lb of carbon feed each day, the average lb/mil gal, and the maximum lb/mil gal are listed under the activated carbon heading. The maximum threshold odor hours for each of these days is listed under that heading, and the ammonia nitrogen hours are likewise listed under its heading. The number of maximum usage days in the June-November 1968 period is 38, which is somewhat higher than the equivalent value for previous years. This increase is confirmed by the total carbon usage for January-November 1968, which is in excess of the usage for the entire year of 1967. This supports the conclusion that the cost of treatment at the SWFP is increasing due in a large degree to pollution.

In Table I-2, we have brought the total consumption in lb/mil gal of activated carbon, coagulants and chlorine up to date through November 1968. As pointed out above, the total carbon consumption in this 11-month period exceeded that for the entire year of 1967. The average lb/mil gal (34) was higher than any value in the

TABLE I-1 (Cont.)

SOME MAXIMUM DAYS OF USAGE
JAN.-NOV., 1968

Yr., Mo., and Day	Activated Carbon Total #	Avg. #/MG	Max. #/MG	Threshold Odors Maximum Hour	Ammonia Nitrogen Max. Hr. (ppm)
1968					
Jan. 18	45,876	121	240	14 Ch	0.068
Jan. 19	50,698	133	411	14 Ch	0.062
Jan. 20	35,652	97	140	6 Ch	0.042
Jan. 21	35,051	100	158	6 Ch	0.024
Jan. 26	34,088	91	204	5 Ch	0.034
Jan. 27	40,080	113	145	6 Ch	0.054
Jan. 28	42,833	123	159	7 Ch	0.060
Feb. 1	59,404	160	203	10 Ch	0.160
Feb. 2	40,367	107	134	5 Ch	0.072
Mar. 16	36,971	102	146	6 Ch	0.04
Mar. 17	32,133	95	239	6 Ch	0.06
Mar. 18	31,139	80	134	6 Ch	0.08
Mar. 19	92,836	246	353	25 Ch	0.25
Mar. 20	61,690	159	338	7 Ch	0.13
Mar. 21	42,755	112	222	7 Ch	0.12
Mar. 29	30,529	81	164	7 Ch	0.06
Mar. 30	39,284	104	162	7 Ch	0.07
Apr. 4	47,894	132	209	12 Ch	0.14
Apr. 7	34,053	110	175	7 Ch	0.12
Apr. 13	34,105	96	221	10 Ch	0.12
Apr. 17	56,283	153	290	10 Ch	0.12
Apr. 19	33,104	85	147	5 Ch	0.10
Apr. 21	30,697	89	195	4 Ch	0.07
Apr. 24	46,678	126	160	6 Ch	0.07
June 6	30,598	58	68	5 DF	0.01
June 7	33,161	54	63	5 DF	0.02
June 8	33,632	58	65	5 DF	0.01
June 9	35,473	65	72	5 DF	0.02
June 10	34,910	61	72	5 Ds	0.06
June 11	39,136	71	86	5 Ds	0.03
June 12	50,959	103	144	8 SF	0.03
June 13	51,117	107	133	5 G	0.03
June 14	40,106	77	119	5 Ds	0.03
June 21	45,285	97	115	5 Ch	0.06
June 23	46,667	111	222	10 Ch	0.05
Sept. 20	37,595	89	105	4 Ch	0.05
Oct. 9	32,479	81	143	6 Ch	0.05
Nov. 1	39,478	108	161	6 Ch	0.14

past 11 years. The average lb/mil gal of coagulants used (106) for the same period is somewhat lower than the overall 11-year average (111) but is still considerably higher than the basic value of 90 lb/mil gal mentioned above. The average chlorine dosage (21.9 lb/mil gal) is less than the values for 1966 and 1967 but somewhat higher than the overall average for the 11-year period. It is considerably in excess of the 13 lb/mil gal, the basic figure mentioned above. In Table I-3, we have brought the cost of the three classes of chemicals for each of the years up through November 1968. It is noted that the cost of activated carbon ($3.00/mil gal) is higher than any value for the previous 11 years and also is higher than the overall average value of $2.04/mil gal. The June-November 1968 costs of coagulants ($2.03/mil gal) is of the same order of magnitude of the previous two years and slightly higher than the overall average for the 11-year period. The cost of chlorine ($0.98/mil gal) is less than the previous two years but is higher than the overall average of $0.95/mil gal for the 11-year period. In Table I-4, we have listed the contract prices per ton for alum, carbon and chlorine, as delivered to Chicago's two water filtration plants. It is noted that the price

TABLE I-2

ANNUAL CONSUMPTION OF ACTIVATED CARBON, COAGULANTS (ALUM, FERROUS SULFATE), AND CHLORINE

1958 - NOVEMBER 30, 1968

YEAR	ACTIVATED CARBON TOTAL #	ACTIVATED CARBON #/MG	COAGULANTS TOTAL #	COAGULANTS #/MG	CHLORINE TOTAL #	CHLORINE #/MG	TOTAL WATER TREATED (MIL GAL)
1958	2,762,540	22	13,705,336	108	2,172,687	16.9	127,478.9
1959	3,035,509	23	14,259,529	108	1,982,719	14.9	131,988.6
1960	2,727,005	21	14,104,178	106	2,545,043	18.9	133,198.4
1961	2,632,923	21	16,088,039	126	2,461,640	19.3	127,603.5
1962	2,865,541	21	15,520,647	117	2,573,491	19.3	132,993.5
1963	3,194,443	23	16,509,311	118	2,898,487	20.7	139,993.5
1964	3,766,446	27	14,627,505	104	3,046,756	21.6	141,096.0
1965	3,094,606	23	14,279,870	104	2,797,986	20.4	136,894.8
1966	4,678,661	33	16,445,820	116	3,518,720	24.8	142,083.8
1967	4,455,273	32	15,778,872	112	3,388,261	24.0	141,106.9
JAN - NOV 1968	4,555,647	34	14,301,569	106	2,965,917	21.9	135,299.9
TOTAL	37,768,594		165,620,676		30,351,707		1,489,737.8
AVERAGE		25		111		20.4	

TABLE I-3

SUMMARY OF COSTS: ACTIVATED CARBON, COAGULANTS (ALUM, FERROUS SULFATE) AND CHLORINE

1958 - NOVEMBER 30, 1968

	ACTIVATED CARBON		COAGULANTS		CHLORINE		TOTAL WATER TREATED
YEAR	TOTAL $	$/MG	TOTAL $	$/MG	TOTAL $	$/MG	(MIL GAL)
1958	215,723.57	1.69	231,346.94	1.81	105,098.08	0.82	127,478.9
1959	237,432.07	1.80	253,823.36	1.92	96,308.97	0.73	131,988.6
1960	213,435.65	1.60	329,818.94	1.80	121,546.69	0.91	133,198.4
1961	206,742.88	1.62	281,796.83	2.21	117,688.60	0.92	127,603.5
1962	230,698.90	1.74	274,973.31	2.07	120,121.66	0.90	132,993.5
1963	253,981.84	1.82	304,475.38	2.17	129,379.43	0.93	139,993.5
1964	296,684.97	2.10	272,187.75	1.93	140,934.75	1.00	141,096.0
1965	243,055.4[illegible]	1.78	268,806.52	1.96	122,776.01	0.90	136,894.8
1966	361,222.18	2.54	303,788.28	2.14	162,470.73	1.14	142,083.8
1967	368,913.81	2.61	293,547.31	2.08	167,047.76	1.18	141,106.9
JAN-NOV 1968	405,452.58	3.00	274,894.30	2.03	132,576.49	0.98	135,299.9
TOTAL	3,033,443.90	--	2,999,458.92		1,415,949.17		1,489,737.8
AVERAGE		2.04		2.01		0.95	

TABLE I-4

CONTRACT PRICES PER TON CENTRAL AND SOUTH FILTRATION PLANTS

1958 - NOVEMBER 30, 1968

	CHEMICAL		
YEAR	ALUM (LIQUID)	CARBON	CHLORINE
1958	$39.07	$156.18	$96.74
1959	40.84	156.44	97.15
1960	40.86	156.53	95.54
1961	40.96	157.04	95.62
1962	41.35	161.01	92.94
1963	40.79	159.01	89.27
1964	41.30	157.24	92.24
1965	39.95	156.70	83.20
1966	40.55	156.70	95.20
1967	41.85	166.60	97.20
1968	43.45	178.00	93.40

of alum has risen from $39.95 in 1965 to $43.45 per ton in 1968. Activated carbon, which remained constant for many years, has risen from a cost of $156.70 a ton in 1965 to $178.00 a ton in 1968. Chlorine has risen from the low point of $83.20 per ton in 1965 to the cost of $93.40 per ton in 1968. There has been an additional $4 increase in price per ton in the open market, so our next contract will probably be $4 a ton higher. While these increases in prices are significant, they are only a part of the reasons for the increases in the total cost of chemical treatment as outlined above.

Federal Water Pollution Control Administration Parameters Exceeded at SWFP

In Table I-5, we have listed the number of days tested and the number of days in which the established parameters were exceeded for 17 of the 24 parameters adopted by the FWPCA Conference for the southern end of Lake Michigan and the Calumet area in January 1966. To the values for the years 1965, 1966 and 1967, we have added the values for the January-October period 1968. During this period in 1968,the coliform bacteria did not exceed the daily average value of 2,500/100 ml on any day of the 299 days tested. The fecal streptococci exceeded the base standard of 25/100 ml on 6 days of 298 days tested. The threshold odor exceeded the single day value of 8 on 7 days of 305 days tested, and the daily average value of 4 on 19 of 305 days tested. And that figure is also obsolete now, the daily average value of 4 on 19 of 305 days tested. The ammonia nitrogen exceeded the daily average value of 0.05 ppm on 8 days of 305 days tested. The phenol-like substances exceeded the single day value of 0.003 ppm on 15 of 202 days tested. The total phosphates exceeded the single day value of 0.04 ppm on 202 days out of 301 days tested. It is significant that the values exceeding the basic parameters most often are those contributing to algal nuisances (namely, ammonia nitrogen and total phosphates) and taste and odor problems (namely, threshold odors and phenol-like substances). It must be concluded that, while there has been some improvement in the quality of the raw water treated at the SWFP, the quality of the water is such that it is still extremely difficult and quite costly to treat. We are disappointed that there has not been greater improvement. It is hoped that the FWPCA program will be rapidly implemented so that we may continuously receive an acceptable quality of raw water at the SWFP.

LEGEND:
≯ Not more than
≮ Not less than

DEPARTMENT OF WATER AND SEWERS - CITY OF CHICAGO - TABLE I-5
CONTROL POINT - OPEN WATER
SOUTH WATER FILTRATION PLANT
COMPARISON OF ACTUAL RESULTS WITH WATER QUALITY CRITERIA GOALS

PARAMETER	QUALITY CRITERIA		ANNUAL EXCEEDING DAILY AVERAGE 1965	1966	1967	Jan-Oct 1968	EXCEEDING SINGLE VALUE 1965	1966	1967	Jan-Oct 1968
Coliform Bacteria	Annual Avg	≯ 200								
(MPN/100 ml)	Daily Avg	≯ 2,500	2/365	0/364	6/364	0/299				
Fecal Streptococci (Number/100 ml)	Single Day	≯ 25					14/127	4/294	8/339	6/298
True Color	Annual Avg	≯ 5								
(Units)	Single Day	≯ 15					0/1	0/218	0/309	0/281
Threshold Odor (Hydro-	Single Day	≯ 8					4/365	37/365	23/365	7/305
carbon and/or Chemical)	Daily Avg	≯ 4	7/365	52/365	35/365	19/305				
Temperature (°F)	Single Day	85					0/365	0/344	0/365	0/304
pH	Annual Range	8.1-8.4								
(Units)	Daily Range	7.7-9.0	0/365	0/364	0/365	0/304				
Dissolved Oxygen	Annual Avg	≮ 90								
(Percent Saturation)	Single Day	≮ 80					2/4	0/10		0/0
Ammonia Nitrogen	Annual Avg	≯ 0.02								
(MG/L)	Daily Avg	≯ 0.05	26/365	43/365	67/365	8/305				
Methylene Blue (Active	Annual Avg	≯ 0.05								
Substance) (MG/L)	Single Day	≯ 0.20					0/23	0/83	0/78	0/127
Chlorides	Annual Avg	≯ 8								
(MG/L)	Single Day	≯ 15					0/170	0/281	1/340	0/299
Cyanides (MG/L)	Single Day	≯ 0.025					0/28	0/11	0/18	0/28
FLUORIDES	Annual Avg	≯ 1.0								
(MG/L)	Single Day	≯ 1.3					0/227	0/277	0/339	0/304
Dissolved Iron	Annual Avg	≯ 0.15								
(MG/L)	Single Day	≯ 0.30					0/79	0/271	0/340	0/303
Phenol Like Substances	Annual Avg	≯ 0.001								
(MG/L)	Single Day	≯ 0.003					48/74	224/272	9/198	15/202
Sulfates	Annual Avg	≯ 23								
(MG/L)	Single Day	≯ 50					0/149	0/272	0/345	0/300
Total Phosphates	Annual Avg	≯ 0.03								
(MG/L)	Single Day	≯ 0.04					34/166	43/266	222/337	202/301
Filterable Residue	Annual Avg	≯ 162								
(MG/L)	Single Day	≯ 200					0/4	0/98	0/102	0/212

Number of days exceeding criteria/Number of days tested

MR. STEIN: Thank you, Mr. Vaughn.

Without objection, all the charts and tables will appear in the record at the appropriate places.

Are there any questions or comments on this very excellent report?

MR. KLASSEN: I had one, Mr. Chairman.

MR. STEIN: Yes.

MR. KLASSEN: Not a comment, just a question.

We always look upon this as kind of a barometer of where we are, and I have got to compliment the Chicago Water Department on their long-continued surveillance.

There are just a couple of questions I had, Mr. Vaughn. On page 3 you indicate without quotes, oil refinery wastes pollution. I would just like to maybe have Mr. Poole comment on this. Is this identifiable as oil refinery wastes as such from oil refineries or is it possibly coming from other industries? I am under the impression that the oil refineries in Indiana are doing a pretty good job and that possibly this is coming from other industries.

The reason I raise this question, because on Figure D-4 you have "Oil refinery" type odors in quotes.

MR. VAUGHN: Well, it possibly should be in quotes. In the technical advisory committee we discussed this at great length and we agreed to refer to these as hydrocarbon wastes.

MR. KLASSEN: I see.

MR. VAUGHN: But since most of our reports previously have used the term "oil refinery wastes" I chose to stick to that term. It is just a matter of words.

MR. KLASSEN: Except it might be placing the oil refineries, who I understand from what was said yesterday, particularly American Oil, have been doing such an outstanding job, it might be placing kind of a stigma on that name. That is my only reason for asking.

MR. STEIN: Mr. Poole, do you want to comment on that?

By the way, Mr. Vaughn, this is a key point in the next phase of the problem we are moving into. Let's see what Blucher says.

MR. POOLE: No, I don't believe I have

any comment to add to the Chicago Water Department choice of reporting odors in a certain way. I merely recall that in one of these previous sessions somebody asked Russ Mallatt a question along this line and his answer, as I recall it, was that based on his experience oil was oil.

And I think on the other hand, because this goes back for 25 years at least, as Jim Vaughn knows, in that the people in the Chicago Water Department have felt that their worst taste and odor problems were associated with refinery type wastes.

I am correct in that, am I not, Jim?

MR. VAUGHN: You are right.

MR. POOLE: And you will recall that we have consistently indicated in our reports that the Indiana refineries might have to do more in the way of removal of taste and odor-producing substances, and then the report yesterday of the advanced waste treatment that is being studied by Sinclair and American, I think, is an indication that they are willing to follow through on this point.

While I am talking, I might add, and the only other comment I have to offer, in view of yesterday's experience I told Jim Vaughn before we convened that I would suggest that we have the next session of this Conference somewhere down on the Ohio River and maybe Perry Miller and I could take these odors that are bothering down there with us. (Laughter.)

MR. KLASSEN: One other.

On page 5, Mr. Vaughn, I am not questioning this at all, but this concerns me, this statement, because we are led to believe that with the operation of the O'Brien Locks that the flow is away from the lake in the Calumet River rather than to the lake. But this statement, "contributed to the southern end of the lake by the Indiana Harbor Ship Canal and the Calumet River." Do we have evidence that the Calumet River is contributing pollution to the lake that affects the Chicago water supply? I am just raising the question. I don't know.

MR. VAUGHN: Well, the occasions on which the river flows to the lake are not too frequent. Our samplers make a record of the direction of flow every time they sample, and there have been occasions on which there was flow to the lake.

MR. KLASSEN: I see.

MR. VAUGHN: How many, I couldn't say.

MR. KLASSEN: Then the last question, the last comment, rather, on I-5--of course these concerned all of the Conferees about the dates of the samples that exceeded the standards. I think I have discussed with you concern because we know that apparently the chlorides in the lake are gradually increasing, and I noticed in the Indiana presentation regarding the duPont Company, there is this statement, "Brine from the regenerating zeolite water softening facilities for the boilers"--and this is it--"will be stored and discharged slowly to the receiving stream."

Does this particular receiving stream go into the lake? I presume it does. Mr. Poole?

MR. POOLE: Yes, that is one that discharges to the Indiana Harbor Ship Canal.

MR. KLASSEN: So in effect, and this isn't any criticism of Indiana or the duPont Company, but possibly the Conferees haven't addressed themselves particularly to contributors of brine, and if this is a common practice, where it is in Illinois or Indiana, I think this concerned me, this discharge of brine to the lake in view of your surveillance that shows the chlorides are increasing.

I just want to bring this out as a point that we had better be paying a little more attention to.

MR. VAUGHN: Well, now. chloride values go back to 1926 when the average was around 3 parts per million, and now I notice the recent results analysis are 9 to 11 parts per million. And if you recall, the parameters are staggered parameters that go up, because we recognize that inevitably they are going to go up, and--I don't have that table of parameters.

MR. KLASSEN: I have it here. In 1965 the annual average of 8, 1970, 9, and no single value of more than 15 through 1970. So this is something that I just wanted to bring out.

MR. VAUGHN: I have seen several values of the 9 to 11 order of magnitude.

MR. KLASSEN: That is all, Mr. Chairman.

MR. STEIN: I would like to make a comment.

I think, as always, the Chicago Water Department has made a tremendously valuable contribution.

MR. KLASSEN: Definitely.

MR. STEIN: It seems funny, but it is rare in the field when we put in a waste treatment works that we have certain groups checking the water and the water quality to see what we actually do. We are having this here and this is invaluable.

Now, I do have certain problems. I would like to go into this with you. I think possibly this checking or monitoring may be the face of the water pollution control program and that we will see, both locally with the States and the Federal Government from here on out.

But I don't believe we would have had this case or had the data without the valuable work of Hy Gerstein and yourself, Jim, on this stuff. I noted when you had those slugs that Jim Vaughn indicated, as did Gerstein previously, that immediately somehow these wastes came from Indiana. This may be true. When we were getting the steel companies and the oil companies putting out what you considered massive dosages of wastes, this may have been a fair conclusion. Now, I am not saying the conclusion isn't true now. But here is what we are going to have to do. If we have the perfection of the steel company plants operations, and as Mr. Poole says, oil is oil wherever it comes from--whether it comes from an oil company, whether it comes from a steel company, whether it comes from any company, whether it comes from Indiana or Illinois--when it gets in there oil is oil. I think when it gets to your water intakes we are going to possibly have that problem.

But if we are going to have this, plus the perfecting techniques that some of the oil companies, such as American Oil, are putting in and some of the perfecting techniques that we have heard from some of the steel companies above and beyond that; if we are having a problem with taste and odor or excessive treatment--we are going to have to really work with a fine scalpel on these. This is going to be a very difficult job if we are going to do the job, and this is what it seems to me, and try to relate that to a particular source so we will know where to move.

Now, as far as I can see, we have got several problems. We talked at one conference before about the impossible dream. Maybe we are trying to do something impossible here and the program we have is not fitted to do the job. If it isn't, and this is one of the conclusions, we have to face it.

However, if it is, and I suspect this may be the most likely, that once everything is cleaned up in a generalized sense we may have to deal with particular relatively small exotic kinds of discharges and wastes to handle.

There are several ways of reading your report. When we give this kind of an explanation of this report I think about the fellow who goes to the doctor after he has been dosed up and has spent hundreds of dollars for medicine and care and he says, "Doc, I don't feel a bit better," and the doctor says, "Imagine how much worse you would be if you didn't go through all this treatment." (Laughter.)

Now, there may be something to that. Although I am not sure that the report you have given doesn't indicate that we have kind of peaked off and we are really getting to the point of holding our own. We didn't expect any really spectacular results until this all went into shape.

Now, in the light of what we would expect of all the mills going on line--and maybe the Conferees or you might want to comment on this--I don't know that the reports that you have come up with are not more or less what we would expect at this stage of the cleanup. Frankly, I had thought with the oil companies so far ahead that we might be doing a little better, but evidently we are not, and I think this has to be looked into.

The area that you have touched on, Mr. Vaughn, it seems to me is going to be the continuing job of all of us in this field, and that is what water pollution control is going to be from here on.

Yes.

MR. MILLER: Mr. Chairman, I would like to ask Mr. Vaughn a question.

I note in his report that the annual average dosages of activated carbon have increased markedly in the last three years and also in his report that he indicates in June of this year that he had fishy odors which he attributed to the algae. Looking at his chart, on the maximum days above 30,000 pounds of activated carbon fed, it appears that almost all through the month of June that you exceeded these due to the algae. Now, I am wondering whether this increase come about from the increased use in the summertime that has raised its average, because I recall back on the old records in the summertime you would get down around 8 and 9 pounds of activated carbon per million gallons. Are we down in this area any more in the summertime?

MR. VAUGHN: The algae situation is worse and the incidence of Dinobryon used to be really once every several years, but we have it now every year. I would say at least part of the increase is due to the fishy taste, and a very high algal count, you know, will produce a fishy taste too, and when the total count gets around 40,000 per milliliter, why, you will get a fishy taste whether Dinobryon is present or not. But the Dinobryon as many as 30 per milliliter will give you a fishy taste. So at least part of the increase is due to that.

But also the industrial wastes are getting more difficult to remove. They are not as easy as they used to be.

MR. STEIN: Isn't that algal taste--and you say you are getting it every year--related to the larger problem we dealt with at the Lake Michigan Conference, the insidious signs that Dr. Bartsch pointed out, the eutrophication of the lake? I think this is something that we are just going to have to face; it is here.

MR. VAUGHN: I will agree to that, that we can never expect to be free of algal nuisances in the future.

MR. STEIN: And we have just brought the lake to this state and I think we have to live with what we have wrought. Our job, at least at this point, is to try to see that we can live with it and it is not going to get any worse. But we have brought a relatively clean water lake to one in which we do have these pesky algae indigenous every summer. I don't know of any scientist who has indicated to me at the present stage that we are going to get rid of them.

MR. VAUGHN: I don't know how we are going to get rid of them. The head of the Scripps Oceanographic Institute has given some talks on TV in which he suggests the harvesting of algae, but that seems rather way out right now.

MR. POSTON: Mr. Vaughn, I think you have given us a very fine report here. I would like to ask whether you would care to comment on how you see the future here if we are able to eliminate and cut down on the pollution from the Calumet and the Indiana Harbor Ship Canal, the amounts of pollution. Would you see an immediate result showing up or would you see persistence of some of these pollutants for a period of years? I think algae might be one thing, your ammonia and chemicals might be another thing.

Would you care to comment on this?

MR. VAUGHN: We have in past years made a number of wind vector analyses of our chemical wastes and we have traced most of them to the Ship Canal rather than other points along the lake. I have a feeling that if the effluent from the Ship Canal was brought to the same level of quality as the water in the Calumet River at the 92nd Street Bridge that there would be a very definite improvement.

I do not expect to see any improvement, in fact I expect to see continuing increases, not only in chlorides and sulfates but in phosphates and total nitrogen. I don't expect those to improve and the algal nuisances resulting from that will be very significant.

MR. STEIN: Are there any other comments or questions?

MR. POOLE: I don't know what time Mr. Vaughn is talking about, Mr. Chairman, but I would remind you that under the Four-State Conference that the four States have committed themselves to 80 percent removal of the phosphates. We put our major cities on notice already and in this report that was mentioned from Gary yesterday, it has the same engineers, why, phosphate removal is one of the things they have assigned to them.

So I would hope that once that is accomplished, and it is not going to be done within the next couple of years, but the algae situation is going to improve. If it doesn't, we are going to waste a hell of a lot of money around Lake Michigan in the next five to ten years.

MR. VAUGHN: Well, as to time period, I meant, to answer Mr. Poston's question, in the next several years. Five or ten years from now I wouldn't predict what is going to be the situation.

MR. STEIN: Well, as Mr. Poole says, we are trying to meet that problem. The question of maintaining a high quality of water is going to be a continuing one of getting at these pollutants which we are not really considering, except the specialty cases, at the present time. I think this is the next phase. This is what I wanted to point out that we are going into.

We are really dealing with handling the mass doses in this go-round of municipal and industrial wastes which are getting into the waters.

Once that is done, I think it would be almost naive to assume that we are going to solve all the pollution problems--all of them. Particularly when you have a complicated municipal and industrial complex, some of the problems that are matched by this gross pollution begin to come out. We find that we are going to have to take very, very careful specialized approaches and steps to this. I imagine that this is the area that Mr. Vaughn's report is pointing to. I think it is performing the same kind of service that it did at the beginning of pointing up the fact of our problem at your water intake and giving us the kind of material and evidence we needed to get this case going this far.

Thank you.

Are there any other questions?

If not, thank you very much, Mr. Vaughn, for your contribution.

MR. VAUGHN: Thank you.

MR. STEIN: At this point we would like to call on Mr. Robert Bowden for the Surveillance Committee. I guess anyone who has not read the papers or seen TV can be enlightened by Mr. Bowden's report.

PROGRESS REPORT BY ROBERT J. BOWDEN
CHIEF OF THE CALUMET AREA SURVEILLANCE
UNIT OF THE LAKE MICHIGAN BASIN OFFICE
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION, U.S.
DEPARTMENT OF THE INTERIOR, CHICAGO, ILLINOIS

MR. BOWDEN: Good morning, Mr. Chairman, Conferees, ladies and gentlemen:

I am Robert J. Bowden, Chief of the Calumet Area Surveillance Unit of the Lake Michigan Basin Office, Federal Water Pollution Control Administration. I am here to report on the actual changes in water quality that have occurred in the Calumet Area since the enforcement conference was called in 1965.

Mr. Chairman, I would like to have this report entered into the record. I won't read it in full. I will summarize the conclusions at the end of my talk.

MR. STEIN: Without objection, that will be done.

(Which said report is as follows:)

PROGRESS REPORT ON THE WATER QUALITY OF LOWER LAKE MICHIGAN, CALUMET RIVER, GRAND CALUMET RIVER, LITTLE CALUMET RIVER AND WOLF LAKE

DEPARTMENT OF THE INTERIOR

FOR THE PERIOD
JULY 1967 THROUGH JUNE 1968

ILLINOIS-INDIANA

PROGRESS REPORT ON THE WATER QUALITY OF LOWER LAKE MICHIGAN, CALUMET RIVER, GRAND CALUMET RIVER, LITTLE CALUMET RIVER AND WOLF LAKE

BY

DEPARTMENT OF THE INTERIOR

FOR THE PERIOD
JULY 1967 THROUGH JUNE 1968

ILLINOIS-INDIANA

U. S. Department of the Interior
Federal Water Pollution Control Administration
Great Lakes Region
Chicago Program Office

November 1968

TABLE OF CONTENTS

Page No.

INTRODUCTION 3

BACKGROUND 4

DESCRIPTION OF AREA 6

CONCLUSIONS 9

DESCRIPTION OF PROGRAMS 11

STREAM AND HARBOR SAMPLING

Station 1 - Grand Calumet River at Pennsylvania R.R. Bridge 14
Station 2 - Indiana Harbor Canal at 151st St. 20
Station 3 - Indiana Harbor Canal at Dickey Road 26
Stations 4 and 6 - Indiana Harbor 33
Station 7 - Grand Calumet River at Indiana Harbor Belt R.R. Br. 44
Station 8 - Little Calumet River at Wentworth Ave. 50
Stations 9 and 10 - Wolf Lake and Outlet 57
Stations 11, 12 and 13 - Calumet Harbor 67
Station 14 - Gary West Water Intake 76
Station 15 - East Chicago Water Intake 82
Station 16 - Hammond Water Intake 86
Station 17 - Dunne Crib Water Intake 92

PRECIPITATION 97

BIOLOGICAL SAMPLING

Location Map - Biological Survey 98
Biological Sampling 99

BEACH SAMPLING

Location Map - Beach Sampling Program 101
Beach Sampling Program 102

LIST OF FIGURES, MAPS AND TABLES

Page No.

LOCATION MAP - CALUMET AREA 6

LOCATION MAP - Stations 1, 2 and 3 13

- Table 1 - Water Quality - Station 1 16
- Table 1A- Median Values - Station 1 17
- Figure 1B - Bacterial Results - Station 1 18
- Figure 1C - Phenol Results - Station 1 19
- Table 2 - Water Quality - Station 2 22
- Table 2A - Median Values - Station 2 23
- Figure 2B - Bacterial Results - Station 2 24
- Figure 2C - Phenol Results - Station 2 25
- Table 3 - Water Quality - Station 3 28
- Table 3A - Median Values-Station 3 29
- Figure 3B - Bacterial Results - Station 3 30
- Figure 3C - Phenol Results - Station 3 31

LOCATION MAP - Stations 4, 5 and 6 32

- Table 4 - Water Quality - Station 4 36
- Table 4A - Median Values - Station 4 37
- Table 6 - Water Quality - Station 6 38
- Table 6A - Median Values - Station 6 39
- Figure 4B - Bacterial Results - Station 4 40
- Figure 6B - Bacterial Results - Station 6 41
- Figure 6C - Phenol Results - Station 6 42

LOCATION MAPS - Stations 7 and 8 43

- Table 7 - Water Quality - Station 7 47
- Table 7A - Median Values - Station 7 48
- Figure 7B - Bacterial Results - Station 7 49
- Table 8 - Water Quality - Station 8 53
- Table 8A - Median Values - Station 8 54
- Figure 8B - Bacterial Results - Station 8 55

LOCATION MAP - Stations 9 and 10 56

- Table 9 - Water Quality - Station 9 59
- Table 9A - Median Values - Station 9 60
- Table 10 - Water Quality - Station 10 61
- Table 10A - Median Values - Station 10 62
- Figure 9B - Bacterial Results - Station 9 63
- Figure 10B - Bacterial Results - Station 10 64
- Figure 9C - Chemical Results - Station 9 65

LIST OF FIGURES, MAPS AND TABLES (CONT'D)

	Page No.
LOCATION MAP - Stations 11, 12 and 13	66
Table 11 - Water Quality - Station 11	69
Table 11A - Median Values - Station 11	70
Table 13 - Water Quality - Station 13	71
Table 13A - Median Values - Station 13	72
Figure 11B - Bacterial Results-Station 11	73
Figure 13B - Bacterial Results - Station 13	74
LOCATION MAP - Stations 14, 15, 16 and 17	75
Table 14 - Water Quality - Station 14	79
Table 14A - Median Values - Station 14	80
Figure 14B - Bacterial Results - Station 14	81
Table 15 - Water Quality - Station 15	83
Table 15A - Median Values - Station 15	84
Figure 15B - Bacterial Results - Station 15	85
Table 16 - Water Quality - Station 16	89
Table 16A - Median Values - Station 16	90
Figure 16B - Bacterial Results - Station 16	91
Table 17 - Water Quality-Station 17	94
Table 17A - Median Values - Station 17	95
Figure 17B - Bacterial Results - Station 17	96
Table 18 - Precipitation	97
LOCATION MAP - Biological Survey	98
Table 19 - Benthic Populations	100
LOCATION MAP - Beach Sampling Program	101
Table B-1 - Percentage of Beach Failures	105
Figure B-1 - Beach Results - Total Coliforms	106
Figure B-2 - Beach Results - Fecal Coliforms	107
Figure B-3 - Beach Results - Fecal Streptococci	108
Figure B-4 - Coliforms on Five Chicago Beaches	109

INTRODUCTION

This report on the changes in water quality in the Calumet Area is the fifth in a series of reports made by the Calumet Area Surveillance Project of the Federal Water Pollution Control Administration (FWPCA). Previous reports covered the periods July to December 1965, January to June 1966, July to December 1966 and January to June 1967. This report covers July 1967 to June 1968 and includes sections on the beach surveillance programs which were carried on during the bathing seasons of 1967 and 1968 (May 15 thru September 15).

The waters reported on include the Grand Calumet River, the Indiana Harbor Canal, Indiana Harbor, the Little Calumet River, Wolf Lake, Wolf Lake Outlet, Calumet Harbor and the lower end of Lake Michigan. Beaches include Rainbow Beach, two Calumet Park Beaches, Hammond Beach, Whiting Beach, East Chicago Beach and the Hammond Beach on Wolf Lake.

The cooperation provided by the Indiana Stream Pollution Control Board, the Illinois Sanitary Water Board, the Metropolitan Sanitary District of Greater Chicago, the United States Coast Guard, U. S. Army Corps of Engineers and others in supplying valuable information and facilities is gratefully acknowledged.

BACKGROUND

Authority and Organization

A conference on pollution of the interstate waters of the Grand Calumet River, Little Calumet River, Calumet River, Wolf Lake, Lake Michigan and their tributaries, called by the Secretary of Health, Education and Welfare under the provisions of Section 8 of the Federal Water Pollution Control Act (33 USC 466 et. seq.) was held in Chicago, Illinois March 2-9, 1965.

Paragraph No. 14 of the Conclusions and Recommendations of the Conferees for this conference provided that "Surveillance will be the primary responsibility of the Indiana Stream Pollution Control Board, the Illinois Sanitary Water Board and the Metropolitan Sanitary District of Greater Chicago. The Department of Health, Education and Welfare will make available a resident technical group and visiting groups of experts which will assist the State agencies and the Metropolitan Sanitary District of Greater Chicago at such time as requested by them."

The State of Indiana, on April 6, 1965, and the State of Illinois, on April 16, 1965, requested an extensive sampling program by the Federal government to monitor the water quality in the Calumet Area. The Metropolitan Sanitary District has not formally requested a sampling program, but has requested laboratory assistance in the analysis of samples they have collected and in special studies they have conducted on chlorination of the effluent from their sewage treatment plant. The Calumet Area Surveillance Project was organized in the latter part of June 1965 to fulfill the requirements of paragraph No. 14 and the requests of the states.

On January 1, 1966 the Federal Water Pollution Control Administration was created within the Department of Health, Education and Welfare and incorporated the surveillance project.

On May 10, 1966 the Federal Water Pollution Control Administration was transferred from the Department of Health, Education and Welfare to the U. S. Department of the Interior.

Purpose and Scope

The purpose of the Calumet Area Surveillance Project is to assess the progress in the abatement of pollution in the conference area in cooperation with appropriate state and local agencies. This is being accomplished through a sampling program to monitor the water quality at various locations within the conference area. Streamflow measurements are being made so that laboratory analyses in milligrams per liter can be converted to pounds per day. The information obtained through federal, state and local sampling programs and the information furnished by the industries to the state or other responsible agencies on the quality and quantity of their waste flows are evaluated.

Reports are prepared and presented to the Conferees and reconvened conferences on the current water quality and the progress toward abatement of the pollution.

Criteria

The conclusions drawn in this report regarding water quality conditions in the Calumet Area are made relative to the joint federal-state water quality criteria approved by the Secretary of the Interior. These criteria are identical to those adopted by the Calumet Area Conferees.

DESCRIPTION OF THE AREA

The Calumet area is a flat plain located at the southern end of Lake Michigan and includes the Calumet-Little Calumet River system, the Grand Calumet-Indiana Harbor Canal system, Wolf Lake and its outlet. It includes approximately 742 sq. miles and forms a part of the continental divide between the Mississippi River Basin and the Great Lakes-St. Lawrence River Basin. Approximately 60% of the area drains to Lake Michigan and the remaining 40% drains to the Mississippi River by way of the Illinois River system. Despite this fact the area is not well drained. There are large, marshy, low-lying areas which are subject to flooding during and after heavy rainfalls. The streams are sluggish and meandering except where they have been artificially maintained and/or supplemented by industrial or municipal waste flows.

The Grand Calumet and the Little Calumet Rivers both traverse the continental divide. On the Grand Calumet the divide is normally located at the Hammond, Indiana Sewage Treatment Plant outfall. Approximately two thirds of the effluent flows west into the Calumet River in Illinois and one third flows east to the Indiana Harbor Canal and Lake Michigan. Rainfall and lake level conditions can cause the divide to shift to either the east or the west.

The location of the divide on the Little Calumet River is not definite and varies over a distance of several miles in the vicinity of Highland, Indiana. The western portion flows to the Cal-Sag Channel in Illinois which connects the system to the Illinois River. The eastern portion flows to Lake Michigan by way of Burns Ditch which discharges to the lake near Ogden Dunes, Indiana.

Flow in the Calumet River is largely controlled by the O'Brien Lock and is usually directed from Lake Michigan to the Cal-Sag Channel except during periods of heavy flooding or low lake levels.

The Indiana Harbor Canal connects the Grand Calumet River to Lake Michigan. The Grand Calumet River east of the Hammond Sewage Treatment Plant outfall is tributary to Lake Michigan through the canal.

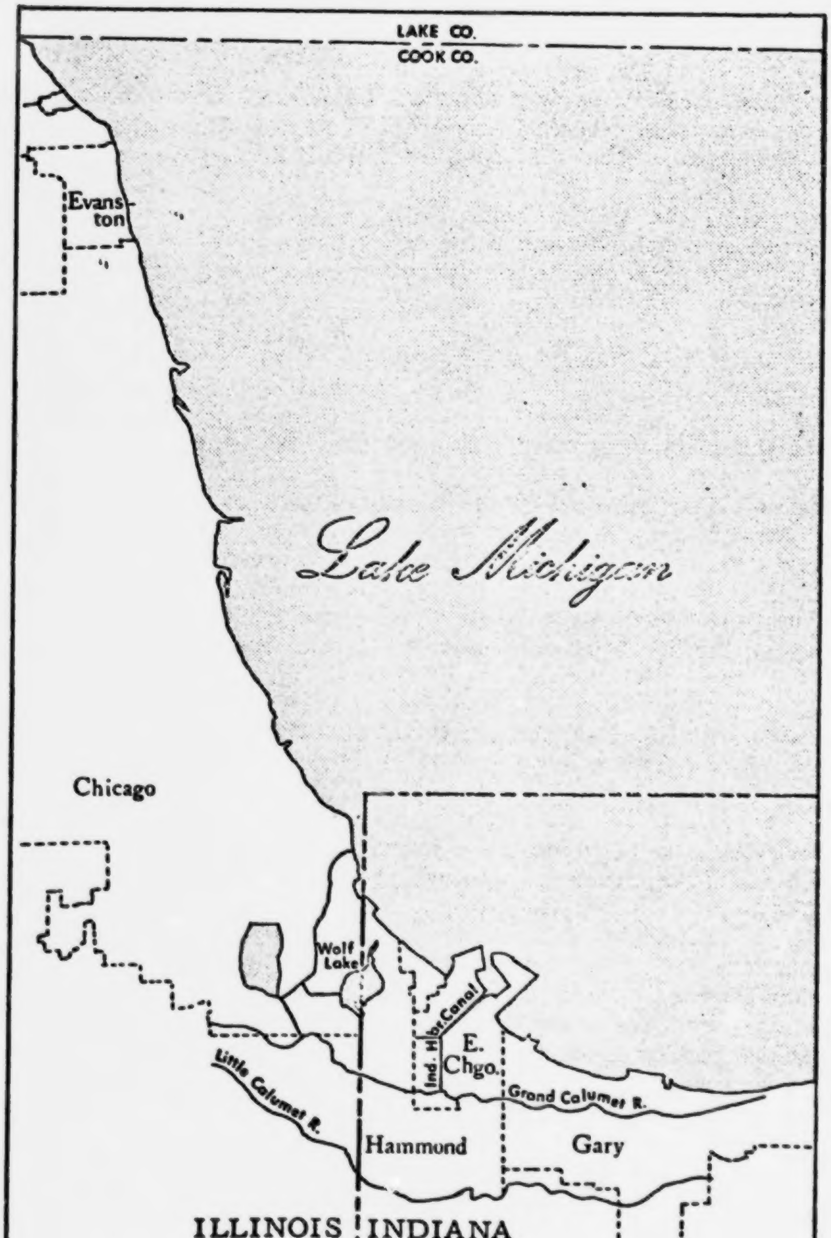
Wolf Lake is located on the Illinois-Indiana state line between Chicago, Illinois and Hammond, Indiana. The original outlet from Wolf Lake to Lake Michigan has been blocked and an outlet to the Calumet River in Chicago has been constructed. The city of Hammond maintains a park which occupies most of the Indiana shoreline of the lake. This park and the lake are extensively used for recreation. The Illinois portion of the lake is a part of the Wolf Lake Conservation Area.

Cities and Industries

The major population centers in the area are East Chicago, Gary, Hammond and Whiting in Indiana; and Calumet City, Chicago Heights and a part of the south side of Chicago in Illinois. The area is highly industrialized.

There are ten major steel mills including the United States Steel Corporation's Gary Works, Gary Sheet and Tin Mill, Youngstown Sheet and Tube Company, and Inland Steel Company in Indiana; and United States Steel's South Works, the Wisconsin Steel Company, the Interlake Iron Corporation, the Republic Steel Corporation and the Acme Steel Company in Illinois. There are five petroleum refineries including the American Oil Company, the Cities Service Petroleum Company, the Mobil Oil Company, and the Sinclair Refining Company in Indiana; and the Clark Oil and Refining Co. in Illinois. Other industries include Lever Brothers, Union Carbide Chemical, E. I. Du Pont, M & T Chemicals, American Maize and a large number of smaller concerns.

These industries are located in three major groups. One group is concentrated along the Calumet River in Illinois. Another is along the Indiana Harbor Canal; and the third is in Gary, Indiana and discharges to the headwaters of the Grand Calumet River. These three groups make the Calumet Area one of the most important industrial centers in the nation and also one of the most significant from the standpoint of water pollution.



LOCATION MAP
CALUMET-LOWER LAKE MICHIGAN
ENFORCEMENT AREA

CONCLUSIONS

1. Industrial pollution in the Grand Calumet-Indiana Harbor Canal system has not been greatly reduced since 1965. Concentrations of iron, cyanide and oil and grease have not been reduced since 1965.

2. Fecal pollution in the Grand Calumet River-Indiana Harbor Canal system has been reduced only in the upstream reach above the Gary Sewage Treatment Plant. Bacterial counts at downstream sampling points have not decreased.

3. Water quality in the western portion of the Grand Calumet River at the state line has deteriorated further since 1965. Concentrations of BOD, COD, ammonia, organic nitrogen, phosphorus, iron, phenol, cyanide, suspended solids and turbidity have all increased since 1965.

4. Water quality in the Little Calumet River does not meet the criteria although there has been some improvement since 1965. The stream is subject to severe pollution from combined sewer overflows.

5. The water quality in Calumet Harbor met all of the criteria for Lake Michigan Inner Harbor Basins except for the criterion on ammonia nitrogen.

6. The water quality at the mouth of the Calumet River did not meet the Lake Michigan Inner Harbor Basin criteria for turbidity, visible oil, dissolved oxygen, ammonia nitrogen, phenol and phosphorus.

7. No regular sampling was done on the Calumet River but special studies indicate that the river is severely polluted between the mouth and the O'Brien Locks.

8. The general lack of improvement in water quality in the streams of the area since 1965 is primarily attributable to overflows from combined sewers. These combined sewers now carry additional sanitary and industrial wastes which have been diverted to them by industry since 1965. Overflows from combined sewers associated with heavy rainfalls during April and May of 1967 and June of 1968 caused significant increases in bacterial counts at all stations.

9. Wolf Lake is a high quality body of water suitable for all water uses, but is threatened by high nutrient concentrations. Except for nutrients there was substantial compliance with the criteria. The average phosphorus concentration at the state line was 0.09 mg/l during 1968, compared to 0.04 mg/l during 1965. Bacterial concentration at the Wolf Lake-Hammond beach violated bathing criteria for the first time during 1968.

10. The water quality at the East Chicago water intake is affected by wastes from Indiana Harbor which cause violations of the criteria for ammonia, total phosphorus and threshold odor.

11. The water quality at the Hammond water intake is affected by wastes from Indiana Harbor and direct discharges to Lake Michigan which cause violations of the criteria for total coliforms, fecal streptococci, ammonia, total phosphorus and threshold odors.

12. The water quality at Chicago's Dunne Crib and the Gary water intake did not meet the criteria for chlorides, ammonia, total phosphorus and threshold odor.

13. Phenol concentrations at the East Chicago and Hammond water intakes met the criteria for the first time during the winter of 1968.

14. The water quality at Rainbow Beach and the Calumet Park beaches failed to meet the criteria approximately 66% of the time during 1966, 20% of the time during 1967 and 33% of the time during 1968. High bacterial counts during June and August of 1968 were associated with easterly winds and heavy precipitation.

15. The water quality at Hammond Beach and Whiting Beach failed to meet the criteria 95% of the time during 1966, 85% of the time during 1967 and 65% of the time during 1968.

16. The water quality at the East Chicago Beach failed to meet the criteria 56% of the time during 1966, 76% of the time during 1967 and 36% of the time during 1968.

DESCRIPTION OF PROGRAMS

Stream and Harbor Sampling Programs

Fifteen stream, harbor and water intake stations were sampled on a weekly basis to determine chemical and microbiological quality. During the period November 1967 to February 1968, sampling was reduced to once per month, due to a reduction in laboratory personnel, which made it impossible to analyze weekly samples. Lake stations, which require a boat for sampling, were not sampled between November and March due to ice and inclement weather on the lake. The results of this sampling program are the basis for this report. The sampling locations are indicated on maps dispersed throughout this report, preceding the discussion of the results for each station.

Beach Sampling Program

Sampling on seven beaches in the area was initiated during May of each year and continued on a twice-weekly basis until September. Six of these beaches are located on Lake Michigan and one on Wolf Lake. A map showing the location of these beaches is on page 101 . Five of the beaches were sampled at their mid-points in water approximately three feet deep. Rainbow Beach and Calumet Inner Beach were each sampled at two locations. Samples were collected on Tuesday and Thursday of each week and analyzed for total coliforms, fecal coliforms and fecal streptococci. This program was coordinated with the beach sampling programs of the Chicago Park District, the Indiana State Board of Health and the Illinois Sanitary Water Board. Data was distributed freely among the agencies.

Automatic Monitoring Program

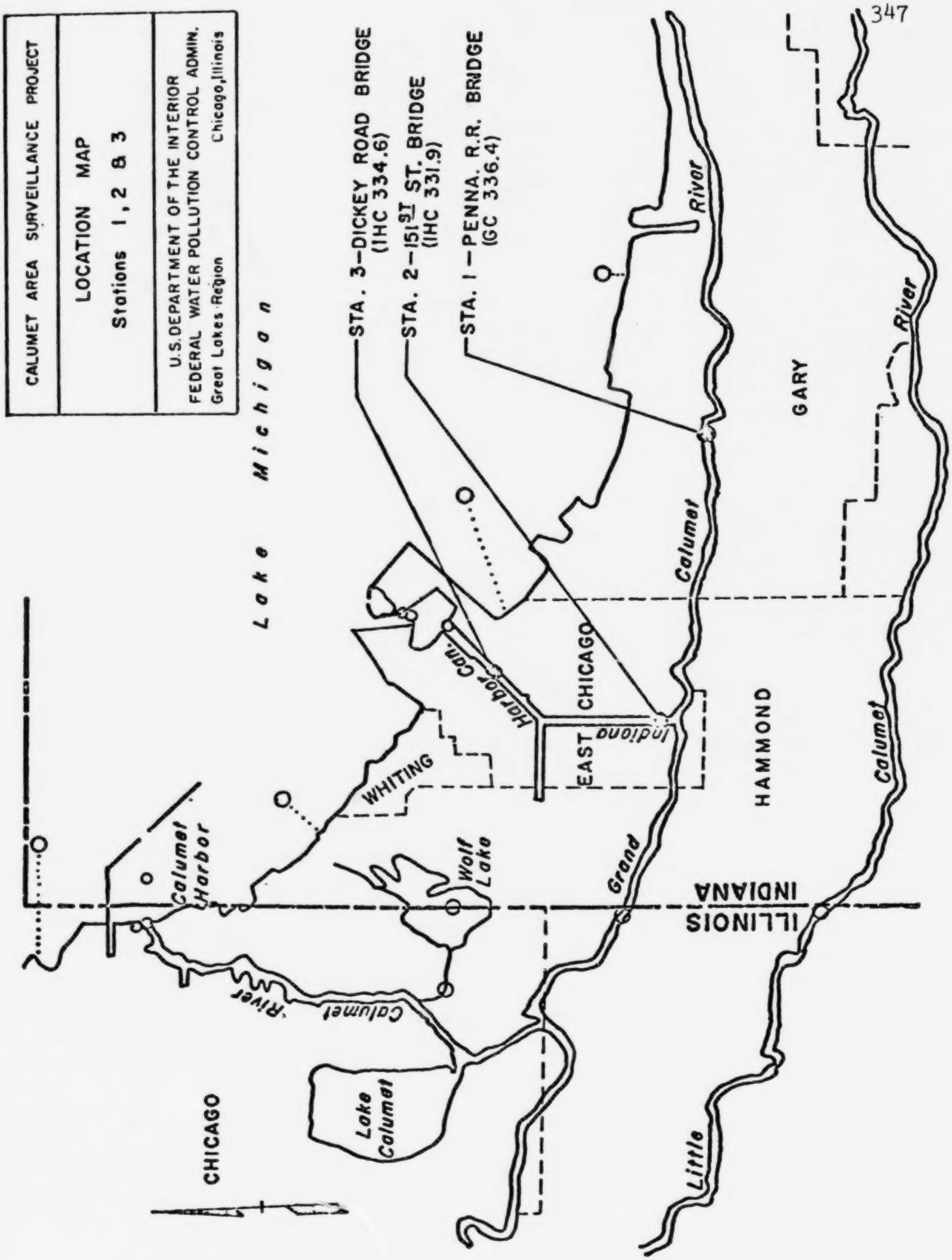
Many operations of the industries in the basin result in discharge of wastes on a batch basis. This may occur at various times, depending on the operations of the industry. These discharges and accidental spills of oil or other pollutants could pass into Lake Michigan or down the Illinois River unobserved by a once-a-week sampling program. As the general quality of the waters in the area improve these spills will become more significant. Such spills will be detrimental to water uses which otherwise would be supported by the improved water quality.

A system of 24-hour automatic water quality monitors is being established in the area to detect such spills. A centralized computer station for the efficient handling of data from these instruments has been proposed to make the system an on-time system with a short reaction time. An on-time system is a system capable of detecting and reacting to pollution as soon as it occurs.

Biological Sampling Program

The kinds and number of aquatic plants and animals inhabiting a particular body of water reflect the quality of the water that prevails in the area. Those that inhabit the bottom reflect the quality that existed in the past. Some organisms are capable of withstanding polluted conditions and will multiply rapidly when competition from other less tolerant organisms is eliminated. These pollution tolerant organisms include sludgeworms, bloodworms, leaches, blue green algae and pulmonate snails. In an unpolluted environment the number of these organisms is restricted by competition from other species but when the other species are killed off by pollution they multiply rapidly. Therefore, the continuous or sudden introduction of toxic wastes, settleable solids or oxygen-consuming materials alters the composition of the benthic population. A balanced benthic population is not restored immediately upon the return of optimum water quality because the lengths of the life cycles of these organisms vary from weeks to years. This fact makes it possible to detect slugs of pollution that have passed through a sampling station.

On April 27, 1967 and April 15, 1968 benthic samples were collected at five points in the area. These stations will be sampled annually to determine changes in the benthic populations. A report on the results of this sampling is included in this report.


CALUMET AREA SURVEILLANCE PROJECT
LOCATION MAP
Stations 1, 2 & 3
U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region
Chicago, Illinois
Lake Michigan
STA. 3—DICKEY ROAD BRIDGE
(IHC 334.6)
STA. 2—151ST ST. BRIDGE
(IHC 331.9)
STA. 1—PENNA. R.R. BRIDGE
(GC 336.4)
CHICAGO
Lake Calumet
Calumet River
Calumet Harbor
Wolf Lake
WHITING
EAST CHICAGO
Indiana Harbor Can.
HAMMOND
GARY
Grand Calumet River
Little Calumet River
ILLINOIS
INDIANA

Station 1 - Grand Calumet River at Pennsylvania R. R. Bridge

The Pennsylvania Railroad bridge is located approximately two miles downstream from the United States Steel Company's complex at Gary, Indiana. The dry weather discharge at this point is 700 to 750 cubic feet per second. Almost all of this flow is industrial waste from the steel mills. Combined sewers in the city of Gary contribute flow during periods of high precipitation.

The volume of domestic waste discharge to the river above this station has been greatly reduced since 1965 but the volume of industrial wastes has not been reduced significantly. Tables 1 and 1A on pages 16 and 17 show that the bacteria counts have declined steadily since 1965. The median total coliform count declined from 100,000 per 100 ml in 1965 to 1400 per 100 ml in 1968. Figure 1B on page 18 shows that bacterial counts have met the criteria adopted by the State of Indiana since October 1967 with the exception of June 1968. The higher counts in June were caused by heavier runoff and are therefore permissible under the criteria. The tables also show that the BOD has decreased slightly since 1965 and that the DO has increased slightly. The maximum criterion for BOD (10 mg/l) was exceeded in 13% of the samples collected during 1968. During 1965 this criterion was violated by 48% of the samples. The criteria for dissolved oxygen have always been met at this station. This is because the station is too close to the sources of waste for the oxygen demand to have been depleted. This improvement is the result of the steel mills' program to separate sanitary wastes from industrial wastes and divert the sanitary wastes to the Gary Sanitary District's sewage treatment plant.

The industrial waste problems at this point have not been significantly improved since 1965. Tables 1 and 1A show that concentrations of iron, phenol, cyanide and ammonia continue to be as high as they were in 1965. Figure 1C on page 19 shows that the winter peaks in phenol concentration were as high as ever and that the criterion for phenol (not more than 20 ug/l) has been almost continuously violated since 1965. The only progress in industrial wastes has been that the periodic high sulfate concentrations with accompanying low pH values which were reported previously did not occur during 1968. This is due to the deep well disposal system for pickling liquor wastes that was completed during December 1967 by U. S. Steel.

The stream is still the same reddish-brown color it was in 1965 and oil has been reported on the surface on almost every occasion that the station has been visited. In addition, sludge beds are continuously being formed in the river. All of these conditions are violations of the criteria.

Criteria consistently violated at this station include:

> Free from floating debris, oil, scum and other floating materials attributable to municipal, industrial, agricultural or other discharges in amounts sufficient to be unsightly or deleterious (Indiana Regulation SPC IR No. 2).

Free from materials attributable to municipal, industrial, agricultural or other discharges producing color, odor or other conditions in such a degree as to create a nuisance (Indiana Regulation SPC IR No. 3).

Free from substances attributable to municipal, industrial, agricultural or other discharges in concentrations or combinations which are toxic or harmful to human, animal, plant or aquatic life (Indiana Regulation SPC IR No. 4).

Substantially free of visible floating oil (Indiana Regulation SPC 8).

Substantially free of sludge banks (Indiana Regulation SPC 8).

Phenol-like substances: Single value not more than 0.020 mg/l (Indiana Regulation SPC 8).

WATER QUALITY - TABLE 1

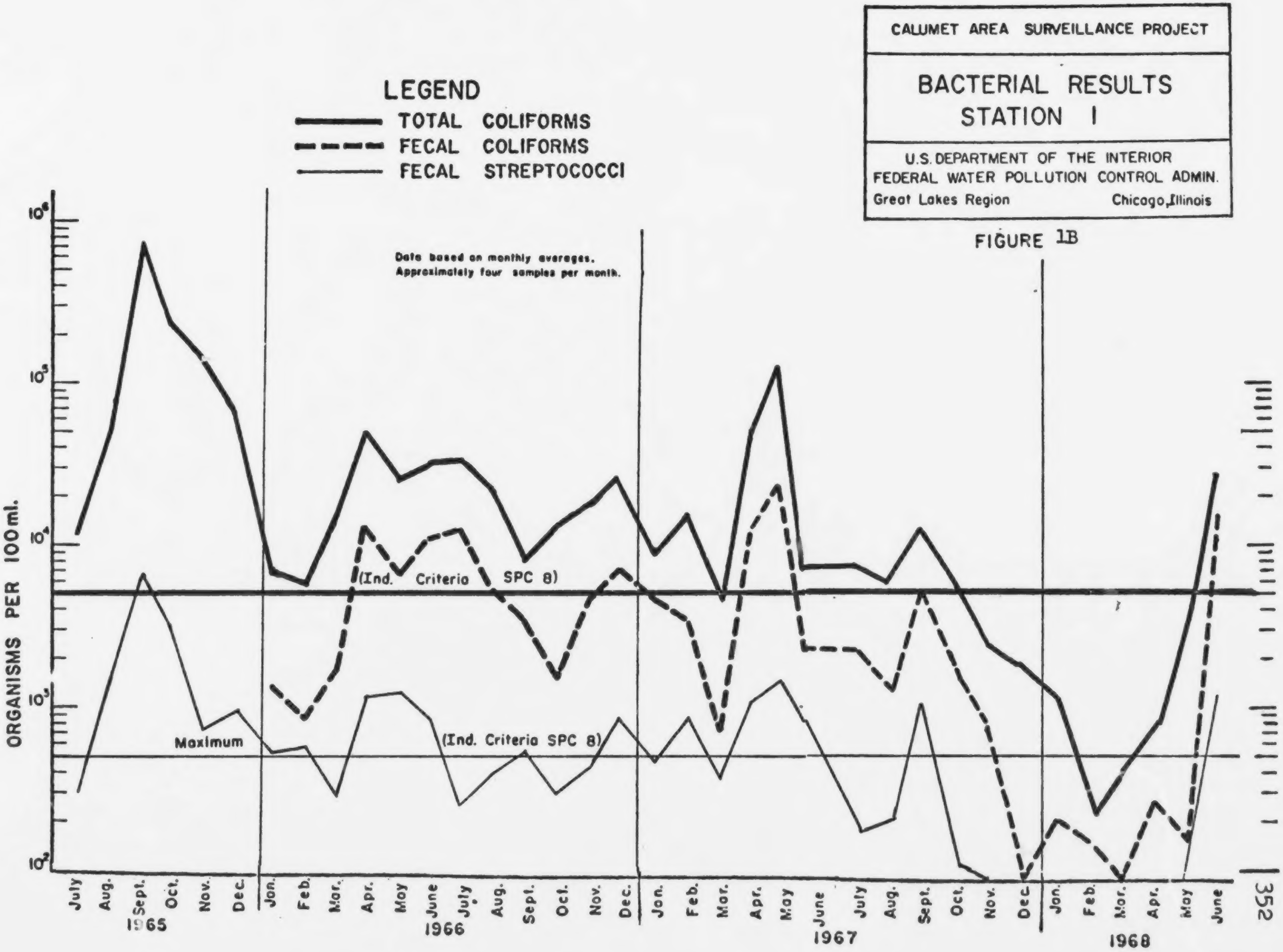
STATION 1 - GRAND CALUMET RIVER AT PENNSYLVANIA R. R. BRIDGE

Parameter		July-Dec 1965			Jan-Dec 1966			Jan-Dec 1967			Jan-June 1968			Criteria *		
		Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
Temp	°C	29	12	21	32	10	19	28	9	19	29	9	20	32.3		
Tot.Coli.	per 100 ml	1940M	5M	219M	2100M	100	61M	330M	1.5M	21M	25M	250	4250	5000		
Fec. Strep "	" "	29,000	70	2380	4000	10	610	5000	10	573	2400	20	340	500		
Fec. Coli "	" "	-	-	-	71,000	10	6700	73,000	100	5100	1900	30	290			
pH		7.5	4.1	-	8.0	3.6	-	8.6	6.1	-	7.4	6.2	-		med.6.5-9.0	
Diss. Oxygen	mg/l	8.7	1.1	4.6	9.0	2.1	5.3	7.6	0.1	5.3	8.45	5.20	6.75		1.0	3.0 (May-Sep
BOD	"	17	5.7	10	16	2.4	8.3	12	3.1	7.6	26	0.3	8.1	10		
COD	"	152	7.9	42	55	14	30	114	14	40	61	20	35			
Chlorides	"	-	-	-	40	10	17	41	12	21	35	10	20	125		75
Sulfate	"	186	32	60	200	37	60	235	22	59	66	35	47			
NH_3-N	"	3.7	.87	1.5	4.4	.88	2.2	4.9	1.0	1.7	2.0	1.0	1.6	5.0		
NO_2-NO_3-N	"	3.7	.32	.90	11.3	.09	.70	12.0	.09	.40	0.65	0.25	0.44			
Org.Nitrogen	"	3.7	.06	1.5	1.2	0	.45	1.6	0	0.6	0.90	0.20	0.48			
Tot. Phos.	"	.391	.032	.117	.280	.036	.095	1.43	.029	.210	1.06	0.03	0.23			
Sol. Phos.	"	.108	0	.032	.075	.003	.023	.075	.002	.011	-	-	-			
Dis. Iron	"	-	-	-	-	-	-	-	-	-	1.39	0.0	0.36			
Tot. Iron	"	29	2.2	8.9	48	2.6	13	109	5.4	34	22	6.5	13.1			
Phenol	ug/l	392	10	79	320	7.6	90	601	1	156	333	2	85	20		
Oil & grease	mg/l	-	-	-	-	-	-	22	1.8	10.5	27	2.0	8.1			
Cyanide	"	.80	0	.12	.63	0	.27	.66	.07	.35	0.72	0.15	0.39			
Susp. Solids	"	130	26	47	195	29	70	842	12	102	74	6	46			
Diss. Solids	"	364	170	226	380	109	236	458	112	249	258	215	232	500		
Conductivity	umho/cm	-	-	-	765	308	396	525	320	375	395	345	370			
MBAS	mg/l	-	-	-	.28	.07	.14	.34	.05	.16	0.23	0.08	0.15	0.5		
No. of samples			26			52			51			15				

*Indiana Regulation SPC-8

WATER QUALITY - TABLE 1A
MEDIAN VALUES - STATION No. 1
GRAND CALUMET RIVER - PENNSYLVANIA R.R. BRIDGE

Parameter		July-Dec 1965	Jan-June 1966	July-Dec 1966	Jan-June 1967	July-Dec 1967	Jan-June 1968
Water Temp.	°C	21	16	24	14	26	20
Air Temp.	°C	18	7	12	7	13	15
Tot. Coli	per 100 ml	100,000	6,000	14,000	9,000	4,500	1,400
Fec. Strep	" " "	910	400	350	450	100	50
Fec. Coli	" " "	-	2,000	4,000	2,600	1,000	150
pH		6.9	6.9	6.8	6.8	7.2	6.8
Dis. Oxygen	mg/1	4.30	5.80	4.50	5.85	5.00	6.5
BOD	"	8.4	8.6	4.80	9.3	6.5	6.7
COD	"	31	27	33	49	23	37
Chlorides	"	-	18	17	22	19	21
Sulfate	"	52	56	54	50	53	48
NH_3-N	"	1.45	2.4	1.7	1.7	1.6	1.5
NO_2-NO_3-N	"	0.68	0.55	0.55	0.38	0.29	0.44
Org. Nitrogen	"	0.65	0.40	0.4	0.6	0.4	0.44
Tot. Phos.	"	0.09	0.07	0.09	.19	0.15	0.13
Sol. Phos.	"	0.03	0.01	0.01	.01	0.01	0.01
Dis. Iron	"	-	-	-	-	-	0.26
Tot. Iron	"	6.15	5.8	14	49	10.6	12.9
Phenol	ug/1	30.0	129	43	203	32	36
Oil & Grease	mg/1	-	-	-	-	-	6.0
Cyanide	"	0.02	0.39	0.20	.36	.27	0.42
Susp. Solids	"	42	68	62	122	39	45
Dis. Solids	"	225	235	230	240	252	234
Conductivity	umho/cm	-	380	375	385	360	370
MBAS	mg/1	-	0.12	.13	0.16	0.14	0.13
No. of samples		26	26	26	27	18	15

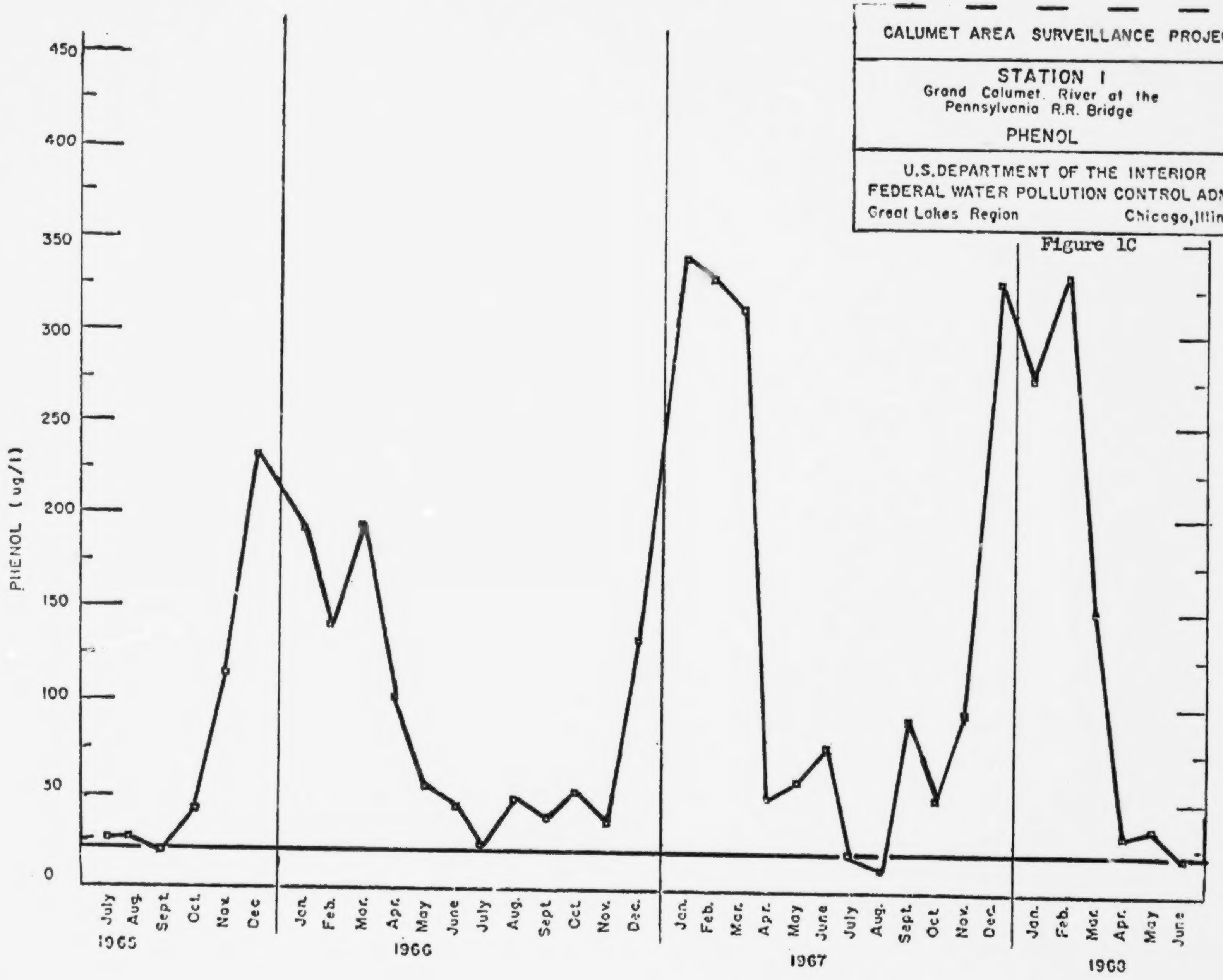


CALUMET AREA SURVEILLANCE PROJECT

BACTERIAL RESULTS
STATION I

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

FIGURE 1B



CALUMET AREA SURVEILLANCE PROJECT

STATION I
Grand Calumet River at the
Pennsylvania R.R. Bridge

PHENOL

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

Figure 1C

Station 2 - Indiana Harbor Canal at 151st Street

The 151st Street Bridge is immediately downstream from the point where the eastern and western portions of the Grand Calumet River converge to form the Indiana Harbor Canal. The quality of the water entering the canal, which flows toward Lake Michigan, is measured at this point. The station is affected by effluents from three sewage treatment plants, as well as effluents from several industries on the Grand Calumet River. This point is not an official control point established by the criteria but criteria for points above and below this point cannot be met unless they are met here and conditions in the lower Indiana Harbor Canal cannot be improved unless the quality of the water entering the canal is improved. The criteria for the Grand Calumet River are used to evaluate progress at this point because the Indiana Harbor Canal is an extension of the river and the criteria for the Canal are written for a point which is much closer to Lake Michigan and is affected by the Lake.

The normal flow at this point is between 800 and 850 cubic feet per second (cfs). Thirty to fifty cfs comes from the western branch of the Grand Calumet River and is primarily effluent from the Hammond and East Chicago sewage treatment plants. The remainder comes from the eastern branch which flows from Gary and is affected by the Gary sewage treatment plant and wastes from the United States Steel complex in Gary, E. I. DuPont De Nemours, M & T Chemical Co. and several smaller industries in East Chicago. The station is also affected by combined sewer overflows to both branches of the Grand Calumet River.

There have been no significant changes in water quality at 151st Street since 1965. Tables 2 and 2A show that pH, dissolved oxygen, BOD, COD, chlorides, sulfate, ammonia, iron, cyanide, dissolved solids, conductivity and MBAS have not changed significantly since 1965. Figure 2B on page 24 shows that coliform counts were reduced from their extremely high counts during 1965 but that there has been no significant improvement since 1966 and the criteria are not met. The decrease during February and March of 1968 must be attributed to the very cold, dry weather that reduced runoff and combined sewer overflows. The counts returned to their 1966-67 levels during May and June.

The reduction in average coliform counts from 2,000,000 per 100 ml in 1965 to 100,000-500,000 per 100 ml was due to the initiation of chlorination by the Hammond and East Chicago sewage treatment plants. Most of the industries have eliminated the discharge of sanitary wastes to the river by diverting them to the municipal sewer systems. The lack of progress in reducing the domestic sewage load on the streams is due to the use of combined sewers which overflow more frequently as sewer systems expand and industries divert more and more waste flows to them. The increased load on the sewage treatment plants is indicated by the increasing concentrations of phosphorus found at Station 2.

Little progress has been made toward the reduction of industrial waste loads. Figure 2C on page 25 shows that the winter phenol peaks were higher during the 1967-68 winter than in previous years. Iron, cyanide and COD have not been significantly reduced.

Samples from this station were composited on a monthly basis and analyzed for heavy metals. The following table compares average values for six-month periods:

	July-Dec '66	Jan-June '67	July-Dec '67	Jan-June '68
Copper	0.07 mg/l	0.03 mg/l	0.04 mg/l	0.02 mg/l
Chromium (total)	0.07 mg/l	0.05 mg/l	0.03 mg/l	0.12 mg/l
Potassium	4.6 mg/l	4.6 mg/l	4.1 mg/l	5.3 mg/l
Manganese	0.24 mg/l	0.47 mg/l	0.24 mg/l	0.28 mg/l
Lead	0.14 mg/l	0.16 mg/l	0.19 mg/l	0.13 mg/l
Nickel	0.03 mg/l	0.03 mg/l	0.02 mg/l	0.01 mg/l
Zinc	1.17 mg/l	1.20 mg/l	0.38 mg/l	0.51 mg/l
Sodium	18 mg/l	20 mg/l	15 mg/l	21 mg/l
Arsenic	-	-	17 ug/l	50 ug/l

The one significant change indicated by this data is the reduction in zinc concentrations. This is a result of the closing down of the zinc ore roasting operation by E. I. DuPont Chemical Company.

WATER QUALITY - TABLE 2
STATION 2 - INDIANA HARBOR CANAL - 151st ST. BRIDGE

Parameter		Sep-Dec. 1965			Jan-Dec 1966			Jan-Dec 1967			Jan-June 1968			Criteria*		
		Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
Temp	°C	27	11	18	31	5	19	28	8	18	28	10	19	32.3		
Tot.Coli. per	100 ml	4,300M	10M	1,140M	360M	6M	88M	1300M	5.3M	155M	370M	1700	42M	5000		
Fec. Strep "	" "	28M	100	4000	19M	50	2500	50M	150	4100	12M	100	1790	500		
Fec. Coli "	" "	-	-	-	320M	500	37M	800M	1000	49M	200M	450	16,500			
pH		7.3	6.3	-	7.9	6.3	-	8.7	6.4	-	7.6	6.0	-		med.6.5-9.0	
Diss. Oxygen	mg/1	7.7	2.1	4.4	8.1	0.2	4.4	7.7	.25	4.6	8.10	3.10	5.80		1.0	3.0 (May-Sep)
BOD	"	13	4.4	9	22	4.9	8.9	15	3.1	8.7	13	3.8	9.6	10		
COD	"	148	7.7	42	60	17	32	179	18	38	76	17	43			
Chlorides	"	-	-	-	70	16	28	50	20	30	50	22	35	125		75
Sulfate	"	128	50	70	138	50	80	125	35	68	73	48	62			
NH_3-N	"	4.0	0.77	2.5	5.1	1.6	3.5	5.9	2.3	3.6	3.4	3.0	3.1	5.0		
NO_2-NO_3-N	"	2.2	0.23	1.1	1.7	.08	.77	1.4	.11	.44	.94	.37	.66			
Org.Nitrogen	"	4.3	0.30	1.2	5.0	0	0.7	2.0	0.2	1.0	.90	.60	.73			
Tot. Phos.	"	1.50	.170	.411	.913	.104	.368	1.40	.273	.564	1.36	.16	.61			
Sol. Phos.	"	.274	.036	.160	.264	.033	.107	.424	.016	.142	-	-	-			
Dis. Iron	"	-	-	-	-	-	-	-	-	-	.51	.09	.23			
Tot. Iron	"	15	.78	4.5	29	1.8	9	61	5.0	20	27.0	5.9	12.8			
Phenol	ug/1	308	9	71	263	15	77	16,757[1/]	5	105	573	18	141	20		
Oil & grease	mg/1	-	-	-	-	-	-	6.8	1.0	3.4	8.3	3.5	5.0			
Cyanide	"	0.53	0	.11	.44	0	.17	-	-	-	-	-	-			
Susp. Solids	"	136	10	41	162	7	61	239	19	62	75	10	50			
Diss. Solids	"	640	240	297	375	160	276	345	208	281	336	215	270	500		
Conductivity	umho/cm	-	-	-	550	385	465	590	330	460	540	365	453			
MBAS	mg/1	-	-	-	.61	.13	.25	.45	.10	.26	0.53	0.17	0.28	0.5		
No. of samples			18			52			51			15				

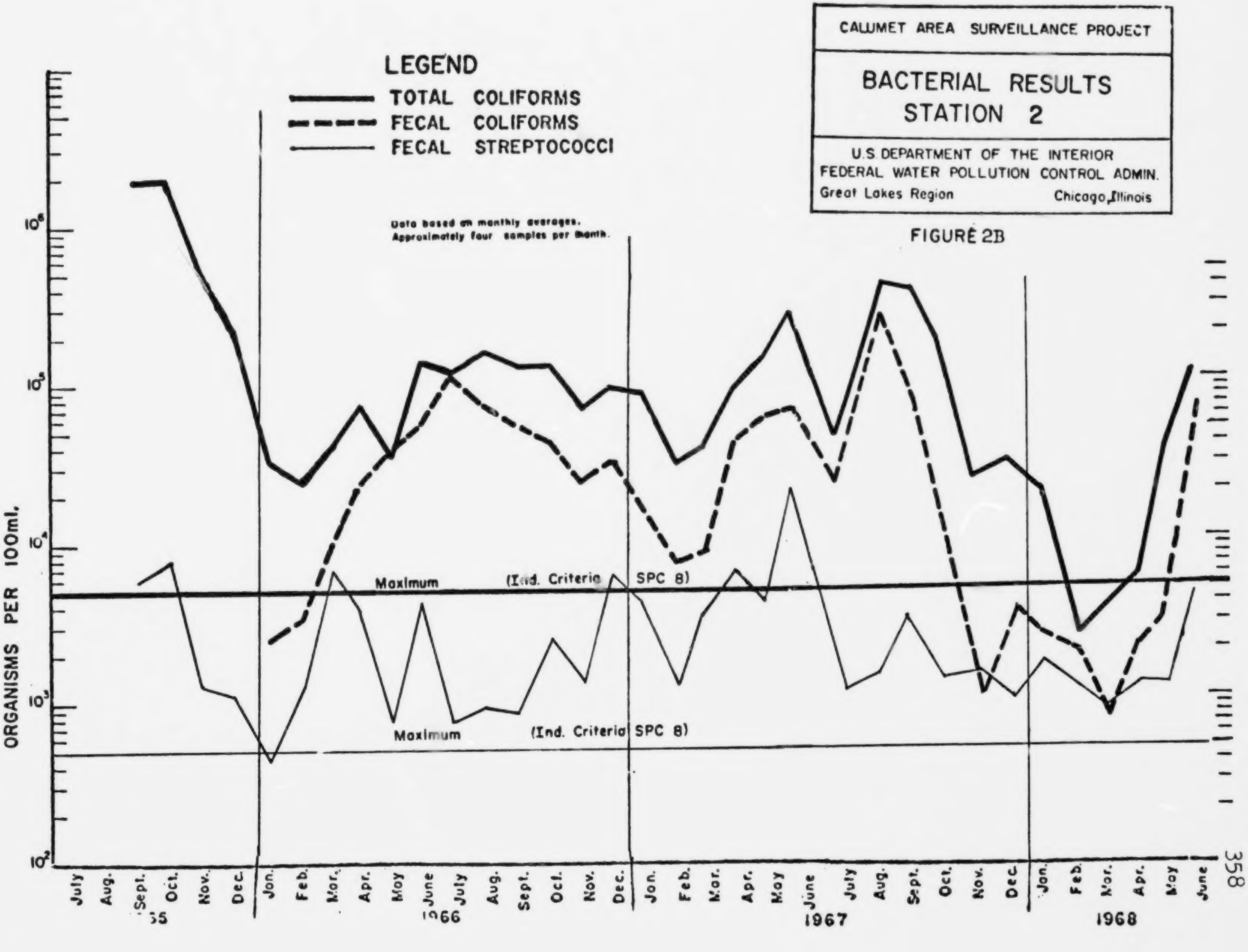
*Indiana Regulation SPC-8

1/ Omitted from mean

WATER QUALITY - TABLE 2A

MEDIAN VALUES - STATION No. 2
INDIANA HARBOR CANAL - 151st ST. BRIDGE

Parameter		Sep-Dec 1965	Jan-June 1966	July-Dec 1966	Jan-June 1967	July-Dec 1967	Jan-June 1968
Water Temp.	°C	18.5	15	22.0	12	24	19
Air Temp.	°C	13	6	14	6	16	15
Tot. Coli.	per 100 ml	550,000	48,000	110,000	75,000	75,000	10,000
Fec. Strep	" " "	1500	1000	850	4000	1000	1000
Fec. Coli.	" " "	-	7500	35,000	20,000	85,000	2,000
pH		7.0	7.0	6.9	6.8	7.3	6.9
Dis. Oxygen	mg/1	4.6	5.60	3.65	4.80	3.8	5.7
BOD	"	11.0	7.6	8.7	11	7.2	9.8
COD	"	39.5	28	33	42	29	36
Chlorides	"	-	32	25	30	26	37
Sulfate	"	66	87	73	74	65	64
NH_3-N	"	2.8	3.3	3.1	4.1	2.8	3.1
NO_2-NO_3-N	"	1.10	0.80	0.65	.45	0.34	0.66
Org. Nitrogen	"	0.90	0.7	0.6	1.0	1.0	0.80
Tot. Phos.	"	.37	.24	.42	.62	0.44	0.62
Sol. Phos.	"	0.15	0.07	0.13	.07	0.14	-
Dis. Iron	"	-	-	-	-	-	0.22
Tot. Iron	"	1.50	4.4	12	29	9.4	12.8
Phenol	ug/1	25	111	32	135	24	74
Oil & Grease	mg/1	-	-	-	-	-	5.3
Cyanide	"	0.20	0.16	0.09	.23	-	-
Susp. Solids	"	34	59	55	81	32	58
Dis. Solids	"	270	295	260	302	265	268
Conductivity	umho/cm	-	480	450	480	420	460
MBAS	mg/1	-	0.29	0.22	.25	.27	.24
No. of samples		18	26	26	26	25	15

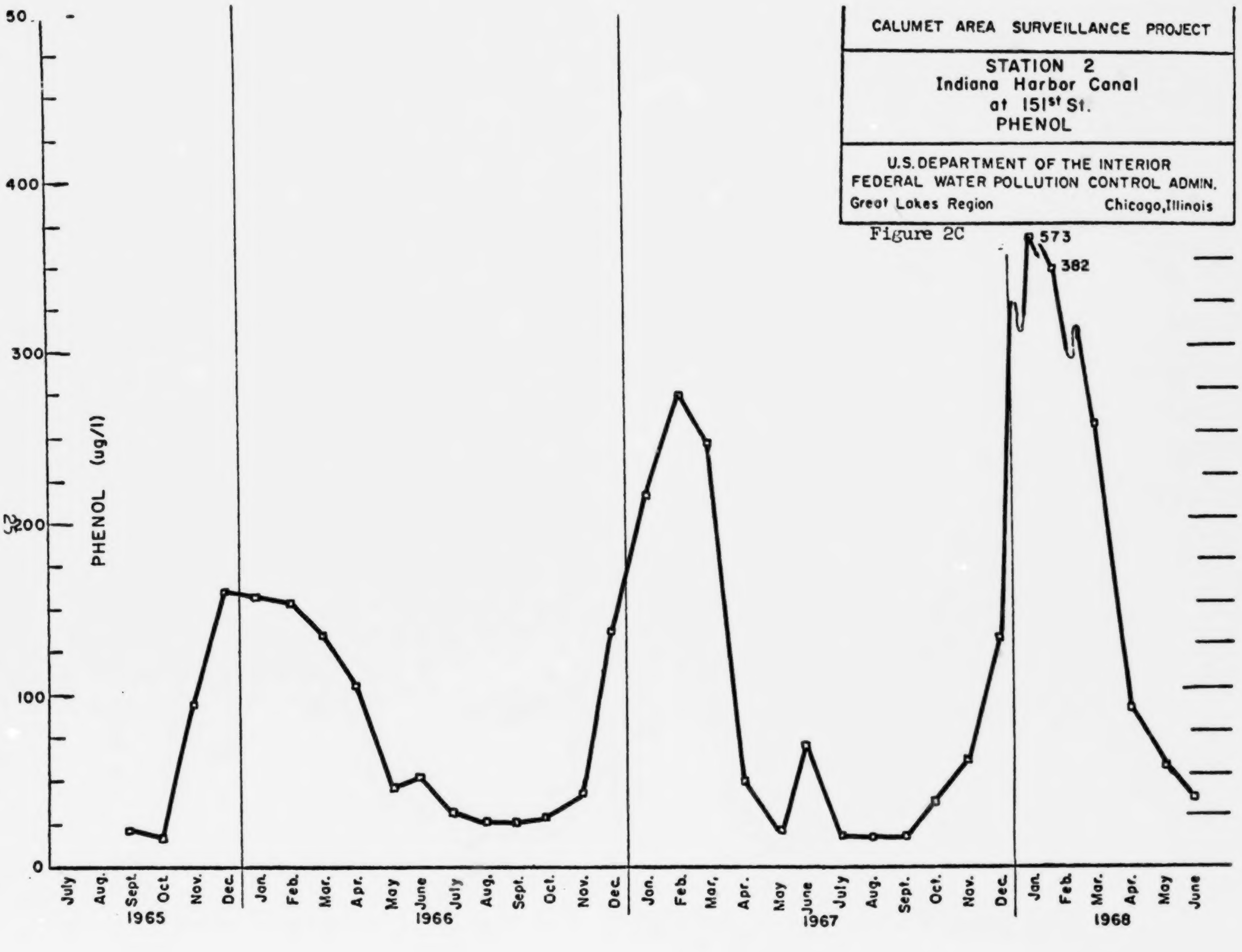


CALUMET AREA SURVEILLANCE PROJECT

BACTERIAL RESULTS
STATION 2

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

FIGURE 2B



CALUMET AREA SURVEILLANCE PROJECT

STATION 2
Indiana Harbor Canal
at 151st St.
PHENOL

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

Figure 2C

Station 3 - Indiana Harbor Canal at Dickey Road

Dickey Road bridge is downstream from the St. George Branch of the Indiana Harbor Canal and receives wastes from all of the refineries on this branch in addition to wastes from the main branch of the canal. It is upstream from most of the wastes discharged by the Youngstown Sheet and Tube Company and the Inland Steel Company, but may be affected by these wastes due to the hydraulics of the canal which acts as an estuary. The water level in the canal fluctuates two or three feet every hour at this station and the flow may be upstream at times. The net discharge toward Lake Michigan is estimated to be approximately 1000 cubic feet per second. Dickey Road is not an official control point designated by the criteria but if criteria above and below Dickey Road are to be met the water quality at Dickey Road must be improved.

There has been little change in water quality of Dickey Road since 1965.

Figure 3B on page 30 shows that bacterial counts at this station are far above the criteria for the Indiana Harbor Canal and have not improved since 1965. Total coliforms follow an annual cycle, rising to approximately 1,000,000 per 100 ml during the summer months and falling to approximately 100,000 per 100 ml during the colder winter months. Fecal streptococci have shown no appreciable change since 1965.

Table 3 on page 28 shows that the other parameters indicative of domestic wastes also reflect a total lack of progress since 1965. The dissolved oxygen depletion was more severe during the summer of 1967 than during 1966. The dissolved oxygen was less than 1.0 mg/l from early May to late in October and was zero during May, June and July. During 1968 it was below 1.0 mg/l on May 2, was zero during July, August and September and did not rise above 1.0 mg/l until late in October.

BOD, ammonia, phosphorus, MBAS and dissolved solids have all maintained their 1965 levels or have risen slightly. It is evident that despite the efforts of the industries to divert sanitary wastes to the sewage treatment plants, the canal is subject to as much domestic pollution as it was in 1965. This is due to discharges from combined sewers which have become more severe and more frequent as industrial wastes are diverted to the sewer system.

There has been little, if any, reduction in industrial wastes in the canal at this station. Total iron, phenol and cyanide concentrations have all increased since 1965. Figure 3C on page 31 shows that the winter phenol peak during the 1967-68 season was high but not as high as previous years. This may be due to the programs by Inland Steel and Youngstown Sheet and Tube Company to reduce the phenolic discharges to the stream.

Samples from this station were composited on a monthly basis and analyzed for heavy metals. The following table compares average values for six-month periods:

	July-Dec '66	Jan-June '67	July-Dec '67	Jan-June '68
Copper	0.08 mg/l	0.05 mg/l	0.09 mg/l	0.06 mg/l
Chromium	0.04 mg/l	0.01 mg/l	0.02 mg/l	0.02 mg/l
Potassium	4.5 mg/l	4.8 mg/l	4.7 mg/l	5.2 mg/l
Manganese	0.22 mg/l	0.32 mg/l	0.18 mg/l	0.18 mg/l
Lead	0.06 mg/l	0.07 mg/l	0.11 mg/l	0.09 mg/l
Nickel	0.03 mg/l	0.04 mg/l	0.03 mg/l	0.03 mg/l
Zinc	0.63 mg/l	0.52 mg/l	0.38 mg/l	0.27 mg/l
Sodium	21 mg/l	24 mg/l	19 mg/l	26 mg/l
Arsenic	-	-	3 ug/l	27 ug/l

This data agrees with the metals data for Station 2. The only significant change is the reduction of zinc reported in the discussion of Station 2.

WATER QUALITY - TABLE 3

STATION 3 - INDIANA HARBOR CANAL AT DICKEY RD.

Parameter		Jul-Dec 1965			Jan-Dec 1966			Jan-Dec 1967			Jan-June 1968			Criteria*		
		Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
Temp	°C	29	11	20	31	8	18	27	7	17	27	10	19	32.2		
Tot.Coli. per	100 ml	2700M	38M	541M	2400M	10M	253M	2700M	10M	480M	1,100M	6500	140M	5000		2000
Fec. Strep "	" "	13,600	400	3400	16,000	64	2400	7500	130	2000	32M	300	3100	100		
Fec. Coli "	" "	-	-	-	450M	600	36M	960M	3500	170M	40M	200	6300			
pH		7.3	6.3	7.0	8.0	6.4	-	7.6	6.2	-	7.5	6.5	-	7.0	4.0	7.5-8.5 (med)
Diss. Oxygen	mg/1	6.4	0.0	1.8	7.2	0	2.6	7.1	0	2.3	6.10	0.00	2.25		2.0	4.0
BOD	"	11	3.5	6.3	18	2.2	5.5	10	2.8	4.9	8.5	3.4	5.7			
COD	"	147	0	34	47	12	23	53	12	27	62	21	32			
Chlorides	"	-	-	-	47	22	30	59	24	37	68	29	48	35		25
Sulfate	"	96	46	71	122	59	78	155	34	70	85	54	73	75		60
NH_3-N	"	3.4	1.1	2.5	6.7	1.5	3.6	6.6	1.7	4.0	3.9	3.0	3.5	1.5		1.0
NO_2-NO_3-N	"	3.5	.31	1.2	2.8	.15	.77	1.9	.03	.55	1.70	0.60	0.97			
Org.Nitrogen	"	5.4	.08	1.7	4.5	0.2	0.7	2.6	0.3	1.0	1.0	0.5	0.7			
Tot. Phos.	"	.359	.078	.192	.424	.016	.199	6.52	.146	.409	0.72	0.02	0.46	.033		.016
Sol. Phos.	"	.280	.013	.095	.176	.026	.085	3.26	.029	.167	0.18	0.02	0.09			
Dis. Iron	"	-	-	-	-	-	-	-	-	-	0.30	0.00	0.14			
Tot. Iron	"	4.9	.88	2.4	9.0	.99	3.1	10	1.8	4.1	5.5	0.2	3.4			
Phenol	ug/1	232	1.2	39	483	10	68	635	5	102	281	8	57	10		5
Oil & grease	mg/1	-	-	-	-	-	-	6.8	0.6	3.3	7.3	1.6	3.7			
Cyanide	"	.29	0.0	.03	.56	0	.10	.75	0.0	.16	.0.36	0.01	0.16	0.1		
Susp. Solids	"	41	6.5	16	84	4	24	43	6	22	30	11	20			
Diss. Solids	"	360	240	291	385	141	293	360	230	304	371	281	317	275		
Conductivity	umho/cm	-	-	-	800	400	498	650	385	484	610	375	506			
MBAS	mg/1	-	-	-	.55	.17	.30	.59	.14	.35	.56	.26	.33	0.5		0.3
No. of samples			26			52			50			15				

* Indiana Regulation SPC-7

WATER QUALITY - TABLE 3A
MEDIAN VALUES - STATION No. 3
INDIANA HARBOR CANAL AT DICKEY ROAD

Parameter		July-Dec 1965	Jan-June 1966	July-Dec 1966	Jan-June 1967	July-Dec 1967	Jan-June 1968
Water Temp.	°C	21.5	14	25	12	22	18
Air Temp.	°C	17	6	13	6	17	14
Tot. Coli.	per 100 ml	270,000	100,000	140,000	55,000	450,000	19,000
Fec. Strep	" " "	1700	1000	900	2000	1400	920
Fec. Coli.	" " "	-	11,000	35,000	10,000	99,000	3900
pH		7.0	7.0	6.9	7.0	6.7	7.1
Dis. Oxygen	mg/1	0.25	4.10	1.55	3.45	0.6	1.9
BOD	"	5.7	5.3	5.0	5.9	3.8	5.4
COD	"	27.3	22	24	28	26	33
Chlorides	"	-	29	30	41	30	47
Sulfate	"	74	78	81	85	75	78
NH_3-N	"	2.65	3.6	3.2	4.7	3.6	3.6
NO_2-NO_3-N	"	1.05	0.75	0.65	0.58	0.25	0.83
Org. Nitrogen	"	1.05	0.6	0.7	1.0	0.6	0.7
Tot. Phos.	"	0.18	0.15	0.24	0.24	0.28	0.43
Sol. Phos.	"	0.09	0.09	0.07	0.07	0.13	0.07
Dis. Iron	"	-	-	-	-	-	0.13
Tot. Iron	"	2.05	2.3	2.9	3.4	4.3	3.4
Phenol	ug/1	20.0	61	24	95	16	21
Oil & Grease	mg/1	-	-	-	-	-	3.4
Cyanide	"	0.00	0.13	0.04	0.18	0.11	0.13
Susp. Solids	"	15.0	19	21	18	22	20
Dis. Solids	"	290	310	280	315	288	313
Conductivity	umho/cm	-	505	470	520	430	510
MBAS	mg/1	-	0.24	0.30	0.35	0.41	0.30
No. of samples		26	26	26	26	24	15

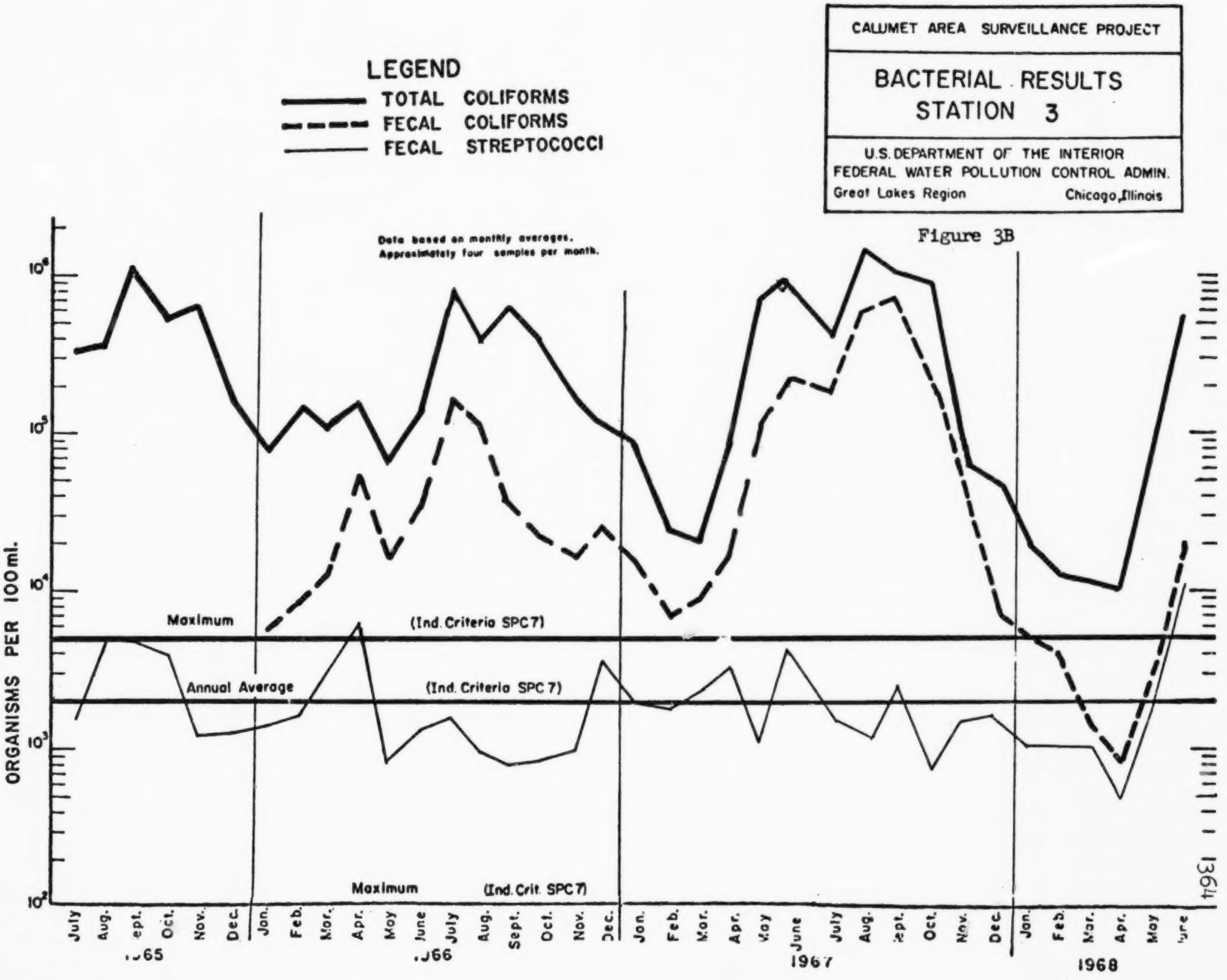
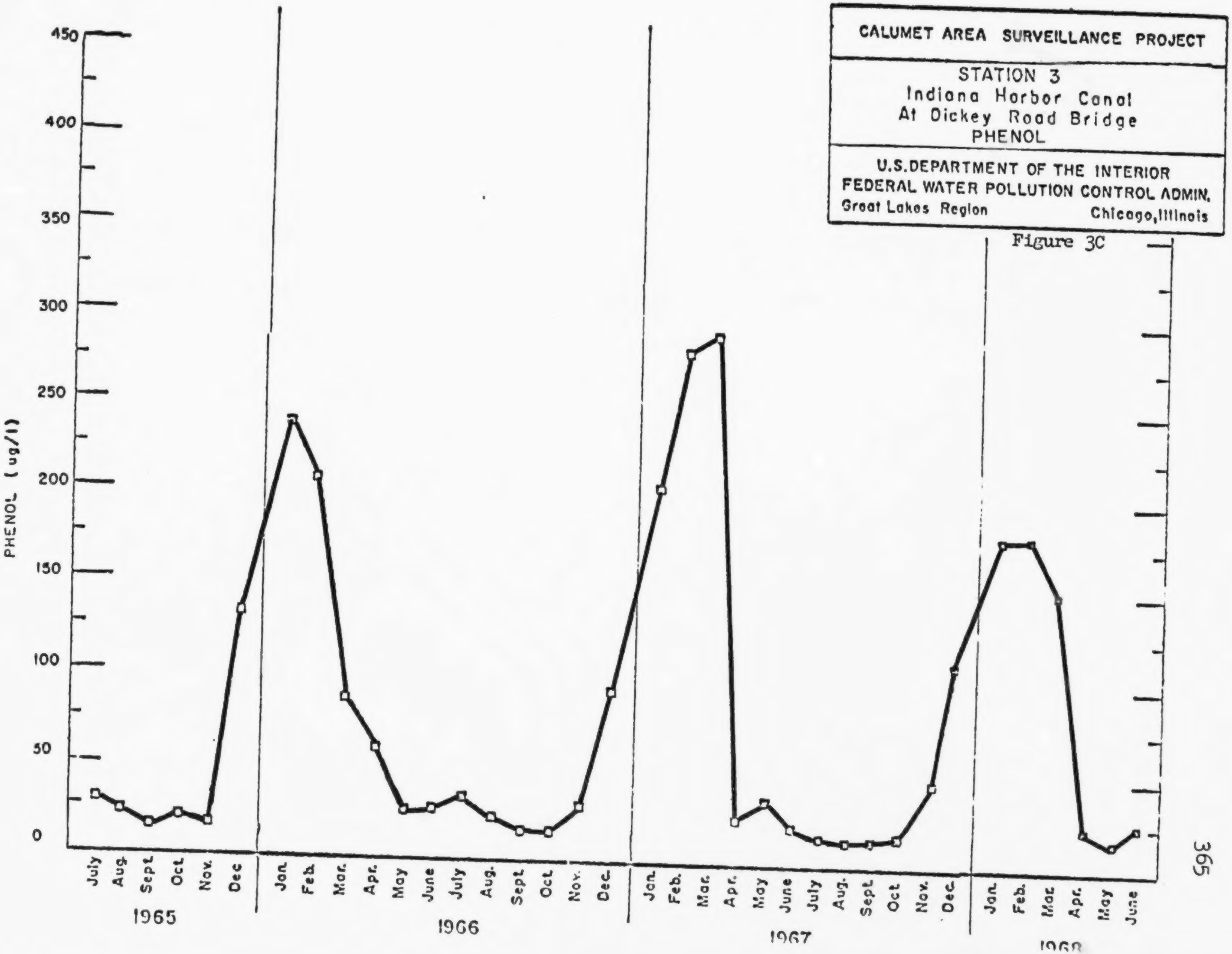

CALUMET AREA SURVEILLANCE PROJECT
BACTERIAL RESULTS
STATION 3
U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region
Chicago, Illinois
LEGEND
TOTAL COLIFORMS
FECAL COLIFORMS
FECAL STREPTOCOCCI
Data based on monthly averages.
Approximately four samples per month.
Maximum
(Ind. Criteria SPC7)
Annual Average
(Ind. Criteria SPC 7)
Maximum
(Ind. Crit. SPC7)
ORGANISMS PER 100ml.
10⁶
10⁵
10⁴
10³
10²
July
Aug.
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.
May
June
1965
1966
1967
1968

Figure 3B

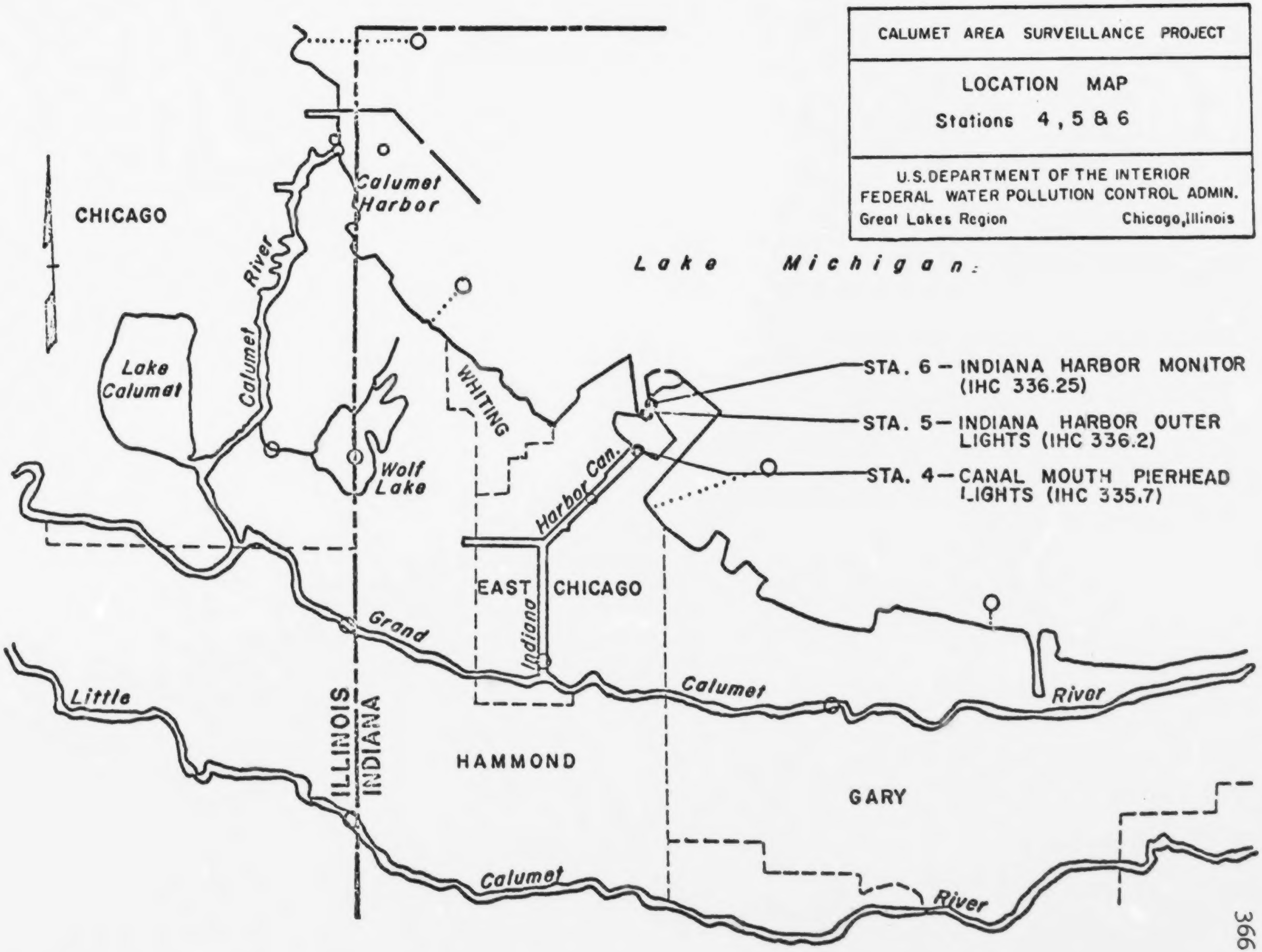


CALUMET AREA SURVEILLANCE PROJECT

STATION 3
Indiana Harbor Canal
At Dickey Road Bridge
PHENOL

U.S.DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

Figure 3C



CALUMET AREA SURVEILLANCE PROJECT

LOCATION MAP
Stations 4, 5 & 6

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

Stations 4 and 6 - Indiana Harbor

Indiana Harbor has been sampled at two points. Station 4 is located at the mouth of the Indiana Harbor Canal, upstream of the Inland Steel and Youngstown Sheet and Tube ship turning basins. Station 6 is located at the east breakwall inner light which is downstream from the ship turning basins and downstream of all industrial discharges to the harbor. Station 6 is the control point for Indiana Regulation SPC 7 which is the criteria for the Indiana Harbor Canal. Station 5 was located in mid-channel opposite Station 6. A comparison of data between Station 5 and Station 6 revealed no essential difference in water quality between the two points. Therefore, Station 5 was discontinued during July 1967. The average dry weather flow past Station 6 to Lake Michigan is estimated as 2700 cfs, but under certain wind and lake level conditions lake water is backed up into the harbor creating the effect of an estuary. The lake water does not mix with the harbor water but forms a wedge which extends in below the harbor water. This separation is caused by the differences in temperature. The warmer harbor water stays above the lake water. The surface of the wedge varies from 8 to 12 feet in depth at Station 6 and between 18 and 20 feet at Station 4.

Figures 4B and 6B on pages 40 and 41 show that bacterial counts in the harbor do not meet the criteria and have not improved since 1965. This agrees with results found upstream at Stations 2 and 3 on the Indiana Harbor Canal. This lack of improvement, despite the efforts by industry to divert sanitary wastes away from the canal and the harbor, is the result of combined sewer overflows to the canal.

The effect of eliminating combined sewer overflows can be seen on Figure 6B. During January and February 1968 the total coliform counts were low enough to meet the criteria. These two months were very dry (see Table 18, page 97) and very cold so that there was very little runoff to cause combined sewer overflows. The spring thaw and heavy rain during June cause the bacteria counts to rise to their previous levels.

Tables 4, 4A, 6 and 6A on pages 36, 37, 38 and 39 reflect similar lack of improvement in DO, BOD, ammonia, phosphorus, MBAS and dissolved solids. All of these parameters indicate domestic wastes.

The level of industrial pollution in the harbor remains high. Concentrations of iron, cyanide and COD have not been reduced and oil was reported on the surface on 11 of the 15 samplings between January and June 1968. Some progress has been made, however. Figure 6C on page 42 shows that the winter peak of phenol which had an average of 252 ug/l in 1967 did not occur during 1968. The maximum phenol concentration found during 1968 is 33 ug/l which does not meet the criterion but does represent a great improvement. This improvement is the result of programs undertaken by the Inland Steel and Youngstown Sheet and Tube Companies to remove phenolic wastes from the canal.

Samples from Station 6 were composited on a monthly basis and analyzed for heavy metals. The following table compares average values for six-month periods:

	July-Oct'66	Jan-June'67	July-Dec'67	Jan-June'68
Copper	0.05 mg/l	None found	0.02 mg/l	0.06 mg/l
Chromium	0.01 mg/l	0.01 mg/l	0.004 mg/l	0.005 mg/l
Potassium	3.2 mg/l	3.7 mg/l	2.9 mg/l	4.0 mg/l
Manganese	0.09 mg/l	0.16 mg/l	0.09 mg/l	0.10 mg/l
Lead	0.03 mg/l	0.02 mg/l	0.04 mg/l	0.05 mg/l
Nickel	0.02 mg/l	0.03 mg/l	0.01 mg/l	0.002 mg/l
Zinc	0.20 mg/l	0.27 mg/l	0.20 mg/l	0.18 mg/l
Sodium	11 mg/l	12 mg/l	8 mg/l	9 mg/l
Arsenic	-	-	2.5 ug/l	20 ug/l

The concentrations of metals at Station 6 is lower than at Stations 2 and 3 due to the dilution effect of the lake. The reduction in zinc was not detected at this station.

The following provisions of Indiana Regulation SPC 7 were violated during the first six months of 1968:

Coliform Bacteria MPN/100 ml

Annual Average (Arithmetic)	*Not more than 2000*
Single Daily Value or Average	*Not more than 5000*

The six month average is 20,500 per 100 ml and 50% of the samples were over 5000 per 100 ml with a maximum of 97,000 per 100 ml.

Fecal Streptococci Number/100 ml *Not more than 100*

35% of the samples were over 100 per 100 ml with a maximum of 900 per 100 ml.

Turbidity

No turbidity of other than natural origin that will cause substantial visible contrast with the natural appearance of the water.

The average turbidity was 12 Jackson Candle Units and the waters were often a reddish or yellow color. Turbidity of Lake Michigan at the water intakes averaged 1.8 Jackson Candle Units.

Oil

Substantially free of visible floating oil.

Floating oil was reported at 11 of the 15 samplings during the first six months of 1968.

pH Units

Annual Median	*Within range 7.5-8.5*
Daily Median	*Within range 7.0-9.0*

The median for the first six months of 1968 was 7.4; 21% of the samples had pH values below 7.0.

Ammonia Nitrogen (N) mg/l

Annual Average	*1.0*	*1.0*
Single Daily Value or Average		*1.5*

The average for the first six months of 1968 was 1.4 mg/l and 33% of the samples exceeded 1.5 mg/l with a maximum of 2.1 mg/l.

Cyanides (CN) mg/l

Single value	*less than 0.1*

During the first six months of 1968 47% of the samples exceeded 0.1 mg/l cyanide with a maximum of 0.19 mg/l.

Phenol-like Substances mg/l

Annual Average	*Not more than 0.005*
Single Daily Value or Average	*Not more than 0.010*

The average for the first six months of 1968 was 0.10 mg/l and 33% of the samples exceeded 0.010 mg/l with a maximum of 0.033 mg/l.

Total Phosphates (PO_4) mg/l

Annual Average	*Not more than 0.05*
Single Daily Value or Average	*0.10*

The average for the first six months of 1968 was 0.40 mg/l and 86% of the samples exceeded 0.10 mg/l with a maximum of 1.44 mg/l.

WATER QUALITY - TABLE 4

STATION 4 - INDIANA HARBOR CANAL AT PIERHEAD LIGHTS

Parameter		Aug-Dec 1965			Apr-Oct 1966			May-Dec 1967			Jan-June 1968			Criteria*		
		Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
Temp	°C	26	11	21	29	12	22	26	14	19	24	10	17	32.3		
Tot.Coli. per	100 ml	830M	57M	212M	240M	5M	81M	1300M	8M	290M	110M	3500	32100	5000		2000
Fec. Strep "	" "	1000	30	428	1700	10	350	1300	90	400	570	30	295	100		
Fec. Coli "	" "	-	-	-	50M	250	11M	360M	3M	67M	20M	100	3700			
pH		7.3	6.8	-	8.0	6.8	-	8.0	6.0	-	8.2	6.5	-	9.0	7.0	7.5-8.5 (med)
Diss. Oxygen	mg/1	6.6	2.4	3.8	7.2	0.9	3.6	5.4	1.6	3.8	7.50	3.00	5.65		2.0	4.0
BOD	"	9.1	2.8	4.7	7.0	2.4	3.9	5.2	1.8	4.0	5.9	2.2	4.1			
COD	"	126	0	37	58	6	17	29	8.5	15	46	10	24			
Chlorides	"	-	-	-	30	10	22	35	13	25	36	19	27	35		25
Sulfate	"	62	34	52	84	23	58	90	24	54	67	29	48	75		60
NH_3-N	"	1.9	.15	1.2	5.6	0.8	2.6	4.7	.95	2.4	3.0	1.8	2.4	1.5		1.0
NO_2-NO_3-N	"	.74	.29	.42	.80	.11	.37	.79	.09	.34	.85	.35	.66			
Org.Nitrogen	"	1.7	.30	.94	1.4	0	0.5	1.9	0.1	1.0	.50	.10	.39			
Tot. Phos.	"	.095	.026	.059	.147	.029	.075	.350	.072	.157	0.26	0.13	0.19	.033		.016
Sol. Phos.	"	.033	.010	.020	.036	.013	.020	.082	.016	.042	0.09	0.04	0.06			
Dis. Iron	"	-	-	-	-	-	-	-	-	-	0.23	0.00	0.08			
Tot. Iron	"	5.0	2.0	2.9	44	1.2	4.4	5.4	1.2	2.8	2.5	0.1	1.7			
Phenol	ug/1	42	5.5	16	84	5	18	41	3	19	55	6	16	10		5
Oil & grease	mg/1	-	-	-	-	-	-	22	1.3	8.6	4.0	1.4	2.6			
Cyanide	"	.01	0	0	.25	0	.06	-	-	-	-	-	-	0.1		
Susp. Solids	"	107	11	31	81	7	19	73	3	19	28	6	15			
Diss. Solids	"	253	215	238	305	130	232	295	178	284	318	204	250	275		
Conductivity	umho/cm	-	-	-	460	300	392	520	325	413	460	350	404			
MBAS	mg/1	-	-	-	.25	.07	.17	.93	.09	.26	0.43	0.14	0.25	0.5		0.3
No. of samples			7			27			20			11				370

* Indiana Regulation SPC-7

WATER QUALITY - TABLE 4A

MEDIAN VALUES - STATION No. 4
INDIANA HARBOR CANAL AT PIERHEAD LIGHTS

Parameter		Aug-Dec 1965	Apr-June 1966	July-Oct 1966	May-June 1967	July-Dec 1967	Jan-June 1968
Water Temp.	°C	23	19	26	19	20	18
Air Temp.	°C	18	14	21	13	7	15
Tot. Coli. per 100 ml		100,000	17,000	80,000	160,000	100,000	10,000
Fec. Strep	" " "	300	170	170	270	490	220
Fec. Coli.	" " "	-	3000	10,000	16,000	45,000	1,000
pH		7.1	7.0	7.1	6.95	6.8	7.2
Dis. Oxygen	mg/l	3.5	3.6	3.15	3.1	4.35	6.0
BOD	"	3.9	4.1	3.7	4.0	3.2	4.2
COD	"	9.3	15	16	19	16	23
Chlorides	"	-	25	22	29	21	23
Sulfate	"	55	70	50	65	52	50
NH_3-N	"	1.14	3.0	2.1	3.4	2.2	2.1
NO_2-NO_3-N	"	0.38	0.3	0.39	.32	0.32	0.7
Org. Nitrogen	"	0.50	0.4	0.5	0.9	0.8	0.45
Tot. Phos.	"	0.06	0.07	0.07	.13	0.16	0.2
Sol. Phos.	"	0.02	0.01	0.02	0.03	0.04	0.06
Dis. Iron	"	-	-	-	-	-	0.04
Tot. Iron	"	2.55	3.0	2.5	3.3	2.4	1.8
Phenol	ug/l	13	18	9	19	9	10
Oil & Grease	mg/l	-	-	-	-	-	2.5
Cyanide	"	0.00	0.07	0.03	-	-	-
Susp. Solids	"	13	16	15	19	13	13
Dis. Solids	"	235	265	210	280	247	246
Conductivity	umho/cm	-	420	370	440	380	400
MBAS	mg/l	-	0.17	0.18	0.28	0.27	0.21
No. of samples		7	12	15	5	15	11

WATER QUALITY - TABLE 6

STATION 6 - INDIANA HARBOR AT EAST BREAKWALL INNER LIGHT

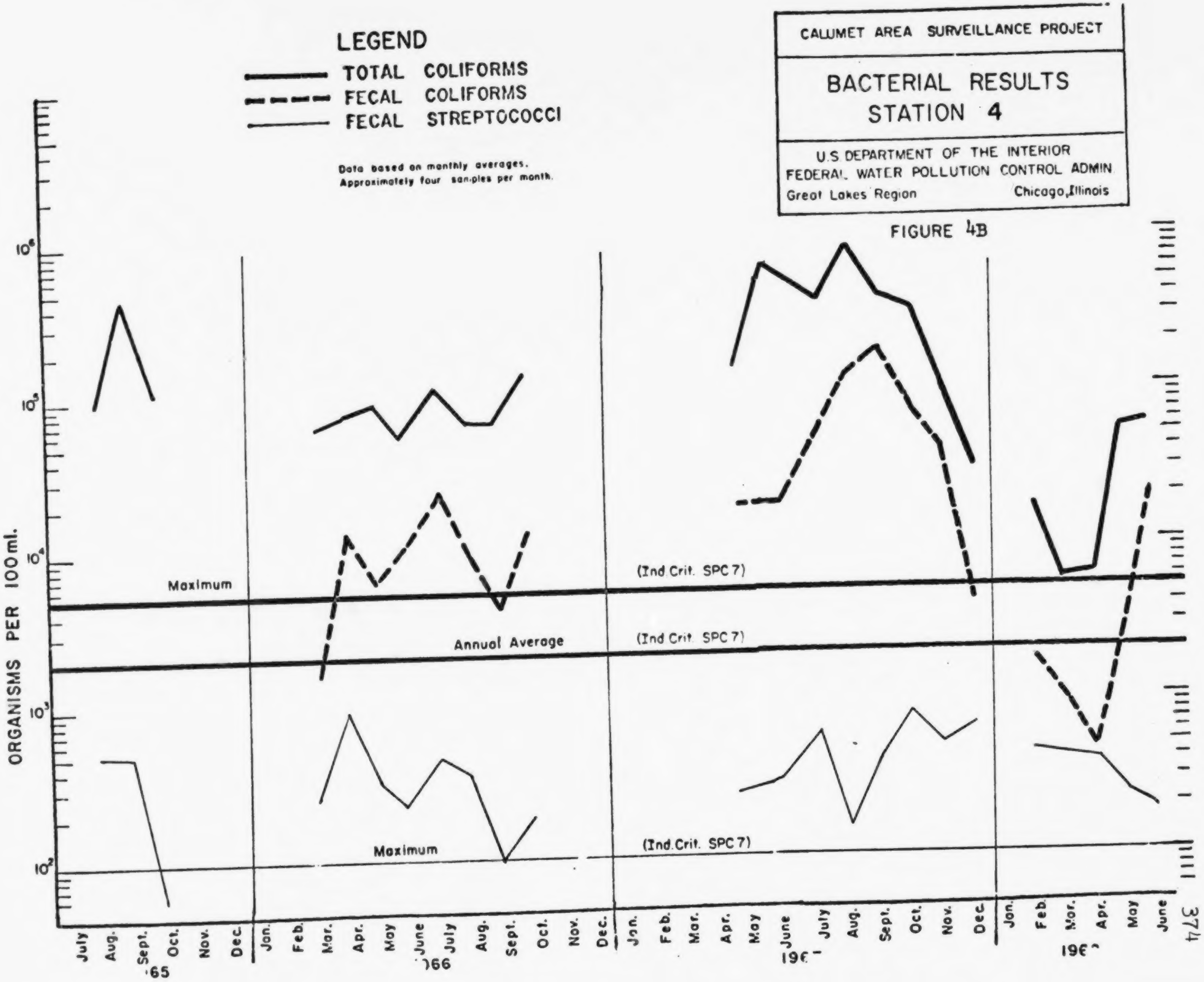
Parameter		Dec 1965			Jan-Dec 1966			Jan-Dec 1967			Jan-June 1968			Criteria*		
		Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
Temp	°C	10	9	9	29	6	16	24	3	16	24	9	16	32.3		
Tot.Coli. per	100 ml	22M	1M	11M	350M	1M	33M	510M	300	55M	97M	400	20,500	5000		2000
Fec. Strep "	" "	530	310	380	1600	10	180	875	20	200	900	20	140	100		
Fec. Coli "	" "	-	-	-	23M	10	2900	97M	100	12M	30M	40	3300			
pH		6.9	6.7	-	8.0	6.6	-	8.0	6.0	-	8.0	6.5	-	9.0	7.0	7.5-8.5 (med)
Diss. Oxygen	mg/1	7.7	7.0	7.5	8.0	1.1	5.9	9.1	0.1	7.1	9.80	3.40	6.56		2.0	4.0
BOD	"	3.4	2.9	3.1	13	1.2	3.7	8.8	1.3	4.5	4.9	1.7	3.4			
COD	"	131	13	87	72	4	16	34	6	11	220	8	36			
Chlorides	"	-	-	-	33	9	21	40	11	24	39	15	25	35		25
Sulfate	"	68	56	64	77	22	51	70	11	43	50	34	41	75		60
NH_3-N	"	1.7	1.5	1.6	2.8	.19	1.7	4.1	.34	1.7	2.1	1.1	1.4	1.5		1.0
NO_2-NO_3-N	"	.60	.30	.46	.80	.10	.45	.65	.09	.32	0.80	0.32	0.50			
Org.Nitrogen	"	0.5	0.2	0.4	2.7	0	0.6	6.4	0	1.2	0.60	0.20	0.41			
Tot. Phos.	"	.120	.026	.062	.456	.026	.065	8.15	.033	.244	0.47	0.03	0.13	.033		.016
Sol. Phos.	"	.059	.033	.036	.098	.003	.023	3.26	.006	.096	0.06	0.01	0.02			
Dis. Iron	"	-	-	-	-	-	-	-	-	-	0.38	0.00	0.12			
Tot. Iron	"	3.1	1.5	2.2	15	1.1	3.4	7.7	.76	2.8	9.0	1.0	2.4			
Phenol	ug/1	24	18	21	422	1.4	21	675	0	53	33	0	10	10		5
Oil & grease	mg/1	-	-	-	-	-	-	3.3	0.5	1.4	5.6	0.3	3.1			
Cyanide	"	.18	0	.06	.35	0	.08	.36	0.0	.10	0.19	0.01	0.08	0.10		
Susp. Solids	"	28	10	17	119	7	23	28	2	14	25	1	10			
Diss. Solids	"	225	210	220	266	128	225	274	164	228	267	204	231	275		
Conductivity	umho/cm	420	390	400	470	310	372	500	275	366	420	310	358			
MBAS	mg/1	-	-	-	.35	.05	.15	.26	.05	.17	0.46	0.08	0.19	0.5		0.3
Turbidity	units	-	-	-	55	1.6	16	25	0.2	12	19	0.6	12			
Color	"	-	-	-	-	-	-	-	-	-	7	0	3			
No. of Samples			3			51			42			15				

* Indiana Regulation SPC-7

WATER QUALITY - TABLE 6A

MEDIAN VALUES - STATION No. 6
INDIANA HARBOR AT EAST BREAKWALL INNER LIGHT
(WATER QUALITY MONITOR STATION)

Parameter		1965	Jan-June 1966	July-Dec 1966	Jan-June 1967	July-Dec 1967	Jan-June 1968
Water Temp.	°C	1965 SAMPLING NOT FREQUENT ENOUGH TO ESTABLISH MEDIANS	12	21	11	20	17
Air Temp.	°C		6	14	13	17	12
Tot. Coli.	per 100 ml		19,000	12,000	11,000	15,000	5400
Fec. Strep	" " "		130	130	200	125	55
Fec. Coli	" " "		3000	3000	1000	7000	300
pH			7.0	7.0	7.2	6.8	7.4
Dis. Oxygen	mg/1		7.1	5.9	8.0	6.7	5.8
BOD	"		3.6	3.3	4.0	4.9	3.6
COD	"		11.0	15	12	12	21
Chlorides	"		22	21	28	19	25
Sulfate	"		66	45	50	37	40
NH_3-N	"		1.9	1.4	2.2	1.1	1.3
NO_2-NO_3-N	"		0.4	.45	0.34	0.3	0.5
Org. Nitrogen	"		0.5	.4	0.5	0.46	0.42
Tot. Phos.	"		.04	0.06	.06	0.1	0.1
Sol. Phos.	"		0.03	0.02	.02	0.03	0.02
Dis. Iron	"		-	-	-	-	0.11
Tot. Iron	"		3.0	2.5	2.8	2.5	1.6
Phenol	ug/1		14	7	41	6	9
Oil & Grease	mg/1		-	-	-	-	3.6
Cyanide	"		0.08	0.03	0.18	0.00	0.07
Susp. Solids	"		15	16	13	11	10
Dis. Solids	"		240	215	236	214	232
MBAS	"		.15	0.14	0.18	0.11	0.15
Conductivity	umho/cm		385	360	400	320	350
Turbidity	units		-	16.5	17	6.5	13.5
Color	"		-	-	-	2.0	3
No. of samples		3	26	25	24	18	15

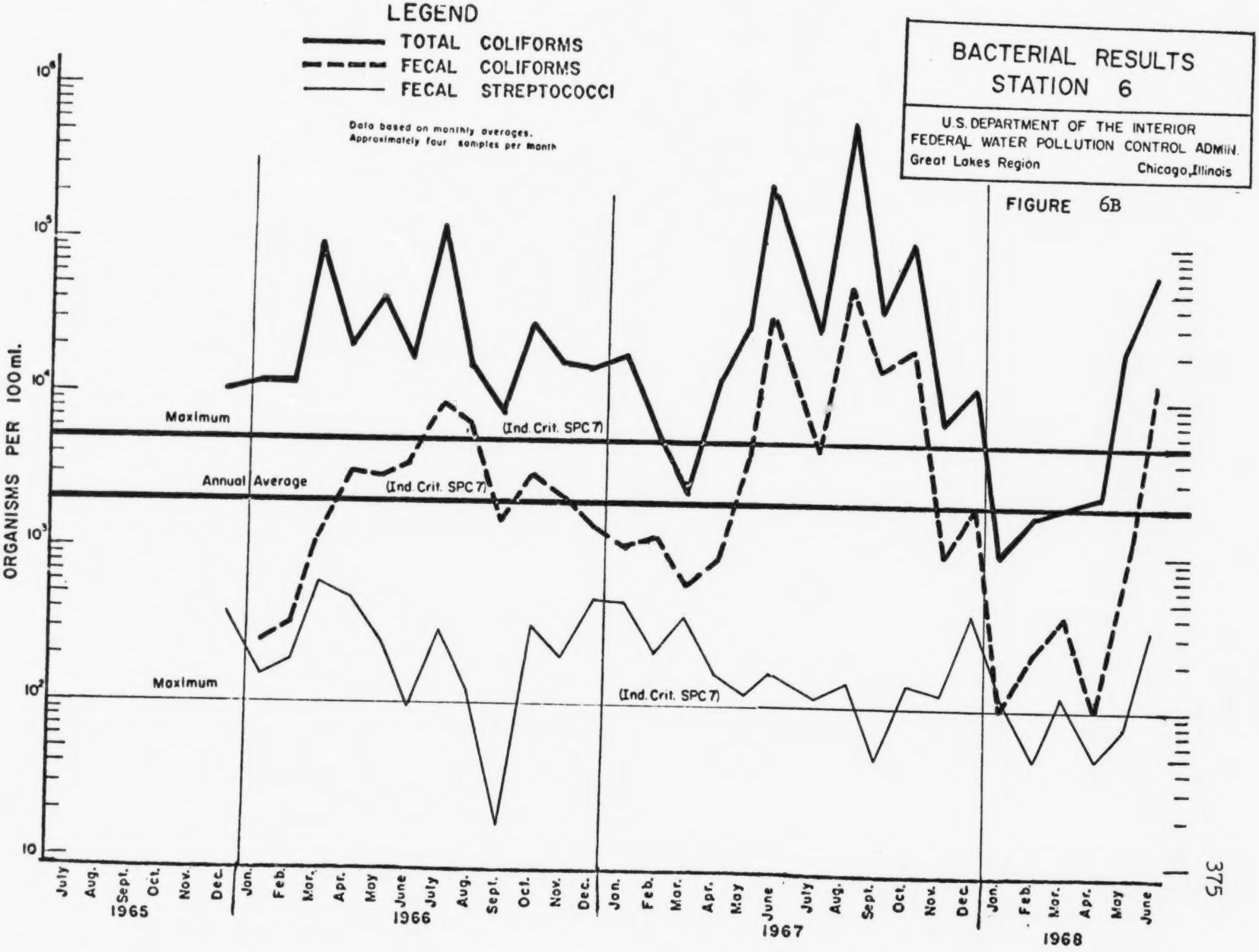


CALUMET AREA SURVEILLANCE PROJECT

BACTERIAL RESULTS
STATION 4

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

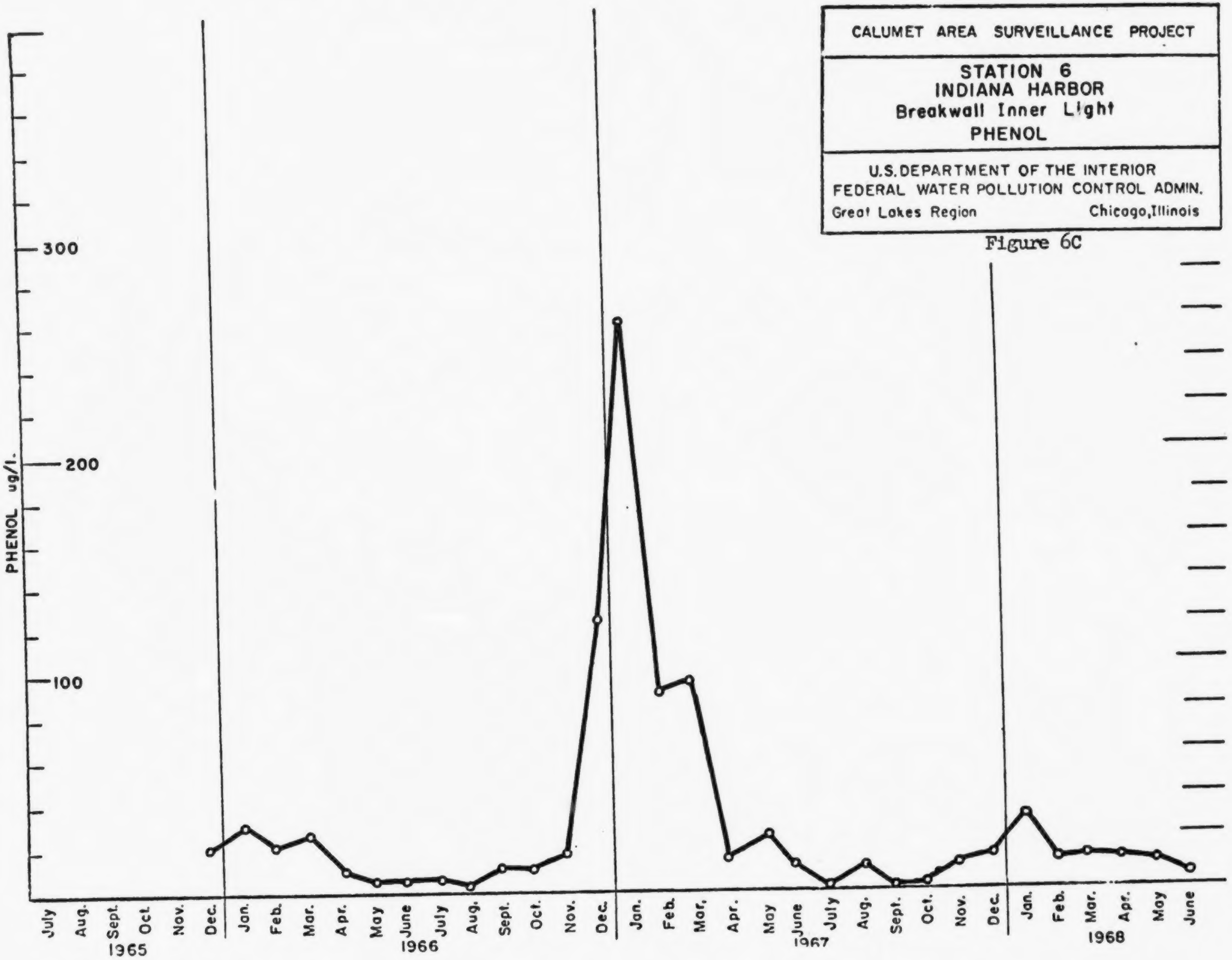
FIGURE 4B



BACTERIAL RESULTS
STATION 6

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

FIGURE 6B



CALUMET AREA SURVEILLANCE PROJECT

STATION 6
INDIANA HARBOR
Breakwall Inner Light
PHENOL

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

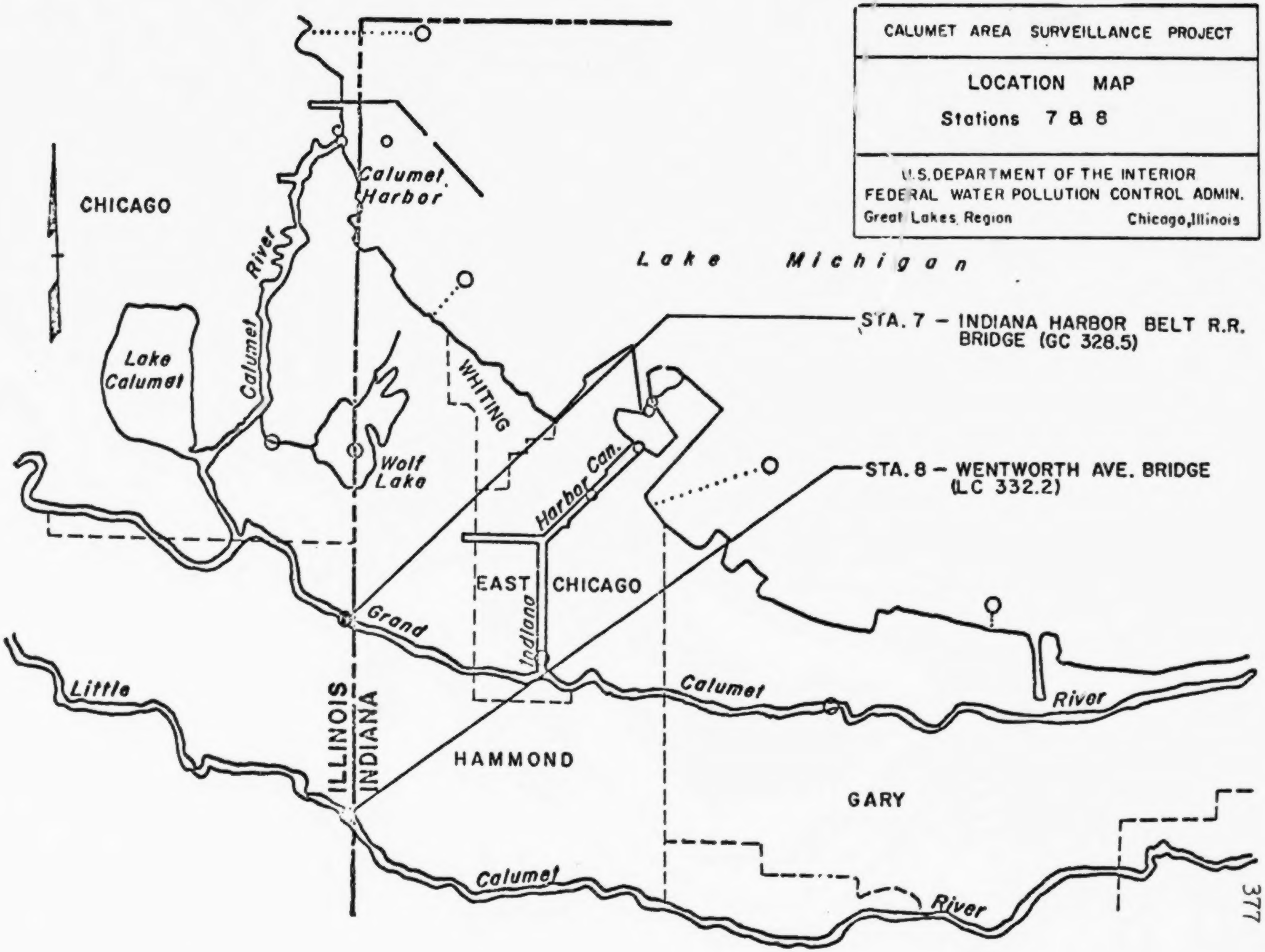
Figure 6C

CALUMET AREA SURVEILLANCE PROJECT

LOCATION MAP

Stations 7 & 8

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois



Station 7 - Grand Calumet River at the Indiana Harbor Belt R.R. Bridge

This station is located on the Grand Calumet River in Illinois within a few hundred yards of the Illinois-Indiana state line and reflects the amount of pollution crossing the state line. It is one of the water quality control points established by the Calumet Area Technical Committee. The criteria developed by the Technical Committee for this point are identical to those adopted by the states of Indiana (Indiana Regulation SPC 8) and Illinois (Rules and Regulations SWB-7 - Rule 1.05).

The flow in the western portion of the Grand Calumet River consists of effluent from the Hammond sewage treatment plant and industrial effluent from a small steel mill and several other industries. During dry weather the flow is approximately 10-15 cfs. Figure 7B on page 49 shows that, although the bacterial counts have been reduced from their 1965 levels, they still reach very high peaks during periods of high flow and in its most improved state the stream does not meet the criteria. The improvement is due to the initiation of chlorination by the Hammond sewage treatment plant. The high counts during periods of high runoff result from a flushing action in the stream bed, combined sewer overflows and outflow from the surrounding swampy areas that are normally stagnant.

Tables 7 and 7A on pages 47 and 48 show increased concentrations of sanitary and industrial wastes and that the water quality has deteriorated further since 1965. Dissolved oxygen was lower during the first six months of 1968 and everyone of the other parameters was higher than in 1965.

This decline in water quality is evidence that the Hammond sewage treatment plant has not been able to keep pace with the rapidly increasing volumes of industrial and sanitary wastes reaching it through an expanding sewer system.

Samples from this station were composited on a monthly basis and analyzed for heavy metals. The following table compares average values for six-month periods:

	July-Dec '66	Jan-June '67	July-Dec '67	Jan-June '68
Copper	0.03 mg/l	0.02 mg/l	0.03 mg/l	0.01 mg/l
Potassium	9.3 mg/l	8.6 mg/l	8.8 mg/l	15 mg/l
Chromium(total)	less than 0.005 mg/l	less than 0.005 mg/l	less than 0.005 mg/l	none found
Manganese	0.09 mg/l	0.22 mg/l	0.13 mg/l	0.03 mg/l
Lead	less than 0.005 mg/l	0.04 mg/l	0.03 mg/l	0.02 mg/l
Nickel	0.01 mg/l	0.02 mg/l	0.02 mg/l	0.02 mg/l
Zinc	0.04 mg/l	0.10 mg/l	0.08 mg/l	0.08 mg/l
Sodium	79 mg/l	88 mg/l	89 mg/l	108 mg/l
Arsenic			26 ug/l	43 ug/l

The data shows that heavy metal concentrations, potassium and sodium, are lower in this section of the Grand Calumet than in the portion flowing to Lake Michigan. The increase in potassium and sodium levels is another indication of the decline in water quality that has occurred since 1965.

The following provisions of the criteria developed by the Calumet Area Technical Committee and adopted by the state of Indiana (Regulation SPC 8) and the State of Illinois (Regulation SWB 7 - Rule 1.05) have been violated during the first six months of 1968.

Coliform Bacteria MPN/100 ml

Maximum Value 5000 except during periods of stormwater runoff.

All of the 15 samples had coliform counts higher than 5000 per 100 ml. The maximum count was 1,200,000 per 100 ml. Two of the 15 samples were taken during periods of stormwater runoff.

Fecal Streptococci Number/100 ml

Maximum value 500 except during periods of stormwater runoff.

All of the 15 samples had Fecal Streptococci counts higher than 500 per 100 ml with a maximum of 160,000 per 100 ml. Two of the 15 samples were taken during periods of stormwater runoff.

Oil

Substantially free of visible floating oil.

Oil on the surface was reported in 14 of the 15 samplings.

Bottom Deposits

Substantially free of sludge banks.

Shifting sludge banks are always visible.

Dissolved Oxygen mg/l

Average (May through September)	*3.0*
Single Daily Value or Average	*Not less than 1.0*

The minimum value of 1.0 mg/l was not violated but the average for May and June was 1.70 mg/l.

BOD mg/l

Single Value	*Less than 10.0*

92% of the samples had a BOD greater than 10.0 mg/l with a maximum of 67 mg/l.

Ammonia Nitrogen (N)   mg/l

Single Value	*Not more than 5.0*

93% of the samples had an ammonia concentration greater than 5.0 mg/l with a maximum of 17 mg/l.

Methylene Blue Active Substances   mg/l

Single Value	*Not more than 0.5 mg/l*

93% of the samples had an MBAS concentration greater than 0.5 mg/l with a maximum of 4.2 mg/l.

Chlorides (Cl)   mg/l

Annual Average	*75*
Single Daily Value or Average	*Not more than 125*

The average chloride concentration for the first six months of 1968 was 114 mg/l. 20% of the samples had chloride concentrations greater than 125 mg/l with a maximum of 315 mg/l. (The high concentrations were found during the winter when salt was being used on the roads).

Phenol-like Substances   mg/l

Single Value	*Not more than 0.020*

87% of the samples had phenol concentrations greater than 0.020 mg/l, with a maximum of 0.046 mg/l.

Filterable Residue (Total Dissolved Solids)   mg/l

Single Value	*Not more than 500*

All of the samples contained more than 500 mg/l dissolved solids with a maximum of 1148 mg/l.

WATER QUALITY - TABLE 7A

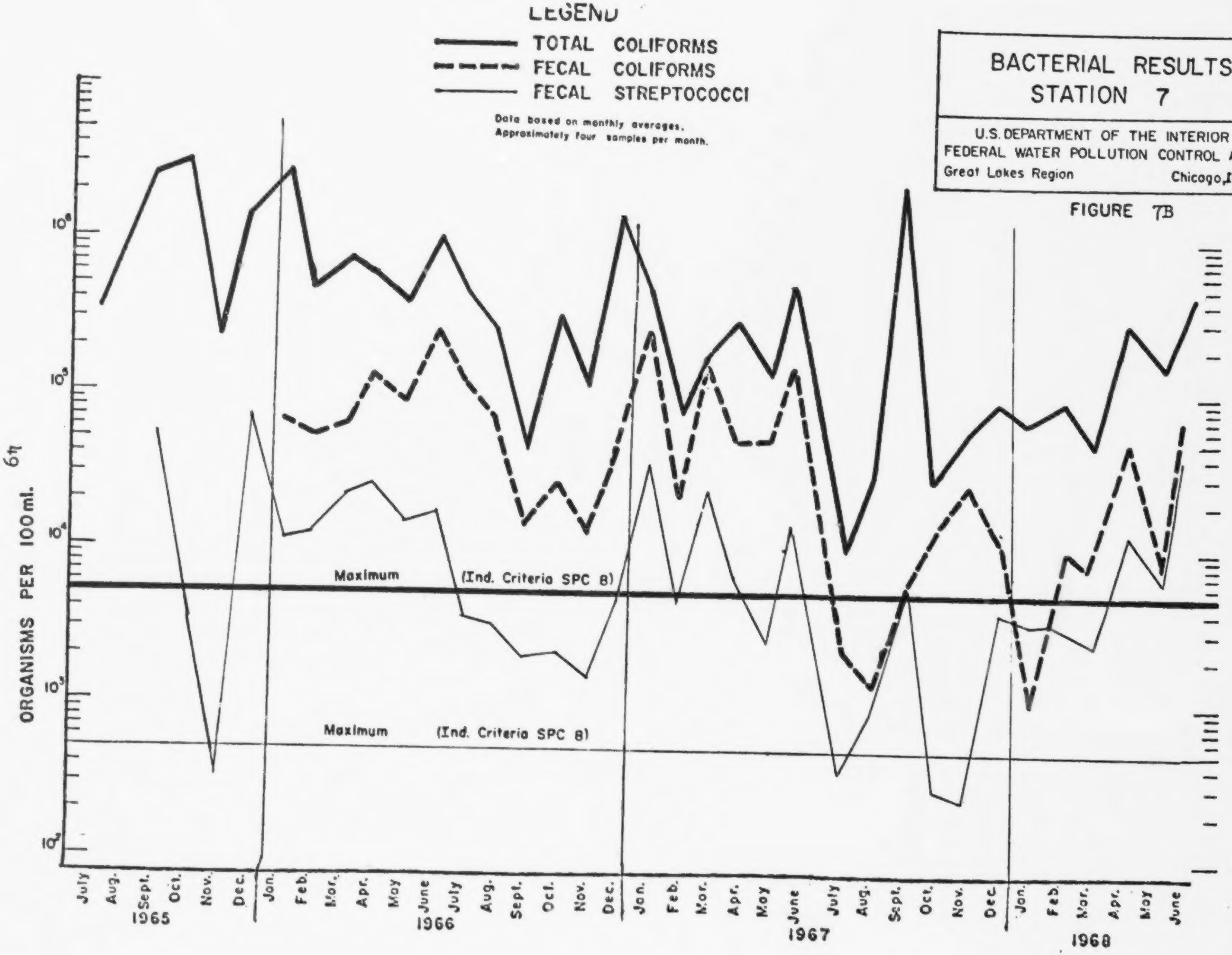
STATION 7 - GRAND CALUMET RIVER AT INDIANA HARBOR BELT R.R. BRIDGE

Parameter		Sep-Dec 1965			Jan-Dec 1966			Jan-Dec 1967			Jan-June 1968			Criteria*		
		Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
Temp	°C	21	5	13	28	3	14	24	0	13	23	4	15	32.3		
Tot.Coli. per	100 ml	8900M	100M	1700M	5300M	1800	677M	9500M	2M	353M	1200M	7500	236M	5000		
Fec. Strep "	" "	330M	40	35M	94M	170	13M	110M	90	8300	160M	200	17M	500		
Fec. Coli "	" "	-	-	-	700M	980	55M	750M	200	104M	250M	800	31,800			
pH		7.4	6.5	-	8.2	6.8	-	7.6	6.5	-	7.6	6.4	-		Med 6.5-9.0	
Diss. Oxygen	mg/1	8.0	0	4.1	9.6	0.0	4.1	11.6	0.0	5.1	5.50	1.20	2.84		1.0	3.0 (May-Sep)
BOD	"	24	35	8.3	104	2.6	20	61	3.1	14	67	4	26	10		
COD	"	155	15	56	224	13	57	160	12	66	297	23	145			
Chlorides	"	-	-	-	180	22	81	212	29	96	315	50	114	125		
Sulfate	"	282	52	174	280	76	178	430	95	189	205	65	152			
NH_3-N	"	11	1.2	4.6	13	0.3	4.2	14	1.1	6.6	17	2.6	10.3	5.0		
NO_2-NO_3-N	"	13	1.2	5.0	15	1.1	6.3	16	.03	2.9	4.60	0.04	0.57			
Org.Nitrogen	"	4.6	.05	1.7	11.9	0.5	2.3	8.1	0.0	2.4	7.0	1.0	3.4			
Tot. Phos.	"	4.57	1.08	2.67	5.54	.294	3.03	16.95	1.33	5.06	13.2	1.5	7.6			
Sol. Phos.	"	3.59	.407	1.92	5.21	.098	1.92	11.08	.326	3.63	8.4	1.7	4.5			
Dis. Iron	"	-	-	-	-	-	-	-	-	-	1.1	0.0	0.43			
Tot. Iron	"	17	.27	2.0	7.9	0.26	1.4	8.1	.21	1.5	6.4	0.39	2.5			
Phenol	ug/1	46	4	15	90	3.0	18	120	2	16	46	9	29	20		
MBAS	mg/1	-	-	-	1.8	.15	.72	3.4	.37	.81	4.2	0.49	1.8	0.5		
Cyanide	"	.12	0.0	.01	.05	0.0	.01	.05	0	.01	0.03	0.0	0.01			
Susp. Solids	"	155	7	27	110	4	27	102	4	29	110	17	48			
Diss. Solids	"	750	185	606	770	90	614	925	234	661	1148	519	723	500		
Conductivity	umho/cm	-	-	-	1500	410	946	1500	365	1000	1840	750	1140			
Turbidity	units	-	-	-	30	1.0	5.4	28	2.7	13	26	8	20			
Color	"	-	-	-	-	-	-	-	-	-	35	20	27			
No. of Samples			18			51			42			15				

* Calumet Area Enforcement Conference - Criteria 5 - Grand Calumet River

WATER QUALITY - TABLE 7
MEDIAN VALUES - STATION No. 7
GRAND CALUMET RIVER - INDIANA HARBOR BELT R. R. BRIDGE

Parameter		Sept.-Dec 1965	Jan-June 1966	July-Dec 1966	Jan-June 1967	July-Dec 1967	Jan-June 1968
Water Temp.	°C	16	9	17	10	19	15
Air Temp.	°C	10	6	16	7	17	14
Tot. Coli.	per 100 ml	900,000	700,000	160,000	110,000	35,000	69,000
Fec. Strep	" " "	1100	12,000	1500	4000	440	3500
Fec. Coli	" " "	-	110,000	33,000	30,000	10,000	4,000
pH		7.2	7.2	7.2	7.1	7.2	7.2
Dis. Oxygen	mg/l	4.7	4.2	3.7	5.8	5.4	2.55
BOD	"	6.1	21	6.2	14	6.9	27
COD	"	52	56	41	70	40	144
Chlorides	"	-	85	78	97	90	90
Sulfate	"	190	192	174	190	165	165
NH_3-N	"	3.2	3.9	2.4	6.0	6.3	10
NO_2-NO_3-N	"	3.8	6.4	5.0	2.4	0.9	0.2
Org. Nitrogen	"	1.6	1.9	1.1	2.3	2.0	3.1
Tot. Phos.	"	2.6	3.0	3.6	2.8	6.29	7.5
Sol. Phos.	"	1.9	0.57	2.74	2.09	5.44	4.0
Dis. Iron	"	-	-	-	-	-	0.31
Tot. Iron	"	0.80	1.3	0.49	1.1	1.6	2.6
Phenol	ug/l	13	19	8.0	18	6	28
Cyanide	mg/l	0.0	.01	0.01	.01	0.01	0.02
Susp. Solids	"	18	28	13	21	21	44
Dis. Solids	"	660	700	590	692	604	696
MBAS	"	-	.63	0.7	0.56	0.64	1.7
Conductivity	umho/cm	-	1020	940	1015	960	1120
Turbidity	units	-	5.1	2.2	9.0	10.5	18
Color	"	-	-	-	-	3.0	25
No. of samples		18	25	26	25	17	15



BACTERIAL RESULTS
STATION 7

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

FIGURE 7B

Station 8 - Little Calumet River at Wentworth Avenue

This station monitors the water quality in the Little Calumet River as it flows from Indiana to Illinois. It is located one-half mile downstream from the state line and is one of the control points established by the Calumet Area Technical Committee. The criteria developed by the Technical Committee for this point are identical to those adopted by the states of Indiana (Indiana Regulation SPC 9) and Illinois (Rules and Regulations SWB 7 - Rule 1.03).

The Little Calumet River drains a considerable watershed that is partly urbanized so that the flow varies greatly with rainfall. The dry weather flow is 5-10 cfs but the flow may reach 500 cfs during runoff periods.

There are no sewage treatment plants on the Little Calumet River upstream of Wentworth Avenue and only one industry, the Simmons Company, which is reported by the state to be in compliance with its treatment requirements. The sources of pollution consist of direct discharges of raw sanitary wastes and combined sewer overflows. Figure 8B on page 55 shows a downward trend in bacterial levels but with many high peaks. This indicates that many of the direct discharges have been eliminated but the stream is still subject to severe pollution from the combined sewers. The Hammond Sanitary District has constructed interceptor sewers which carry some of the wastes from the Griffith and Highland area away from the river.

Figure 8B also shows that the bacterial counts are still far above the level permitted by the criteria. It is doubtful that the criteria can be met until the problem of combined sewers is solved.

Tables 8 and 8A on pages 53 and 54 show that there has been little significant change in BOD, chlorides, phosphorus, dissolved solids and MBAS which indicate that sanitary sewage loads have not been greatly reduced. The low levels of phenol, cyanide and iron indicate that industrial wastes are not a problem at this point.

Samples from this station were composited on a monthly basis and analyzed for heavy metals. The following table compares average values for six-month periods:

	July-Dec'66	Jan-June'67	July-Dec'67	Jan-June'68
Copper	0.07 mg/l	0.03 mg/l	0.01 mg/l	0.02 mg/l
Chromium (total)	0.06 mg/l	0.02 mg/l	0.007 mg/l	0.02 mg/l
Potassium	6.8 mg/l	5.3 mg/l	6.3 mg/l	5/1 mg/l
Manganese	0.23 mg/l	0.23 mg/l	0.21 mg/l	0.15 mg/l
Lead	0.02 mg/l	0.04 mg/l	0.04 mg/l	0.02 mg/l
Nickel	0.20 mg/l	0.08 mg/l	0.09 mg/l	0.01 mg/l
Zinc	0.03 mg/l	0.09 mg/l	0.04 mg/l	0.03 mg/l
Sodium	68 mg/l	40 mg/l	50 mg/l	52 mg/l
Arsenic	-	-	14 ug/l	40 ug/l

These results indicate a reduction in concentrations of copper, chromium and nickel since 1966. These reductions indicate that the efforts of the Simmons Company to reduce plating waste discharges to the stream have had an effect.

The following provisions of the criteria (Indiana Regulation SPC 9 and Illinois Rules and Regulations SWB 7 Rule 1.03) were violated during the first six months of 1968:

Coliform Bacteria MPN/100 ml

Maximum Value 5000 except during periods of stormwater runoff.

87% of the samples had coliform counts greater than 5000 per 100 ml. Two of the 15 samples were taken during periods of stormwater runoff.

Fecal Streptococci Number/100 ml

Maximum Value 500 except during periods of stormwater runoff.

67% of the samples had Fecal Streptococci counts greater than 500 per 100 ml. Two of the ten failing samples were collected during periods of stormwater runoff.

Oil

Substantially free from visible floating oil.

Light oil slicks were reported at 6 of the 15 samplings.

Bottom Deposits

Substantially free of sludge banks.

Sludge banks and bubbles indicating decaying matter on the bottom have been frequently observed.

Dissolved Oxygen mg/l

Average (May through September)	*Not less than 4.0*
Single Daily Value or Average	*Not less than 2.0*

The average dissolved oxygen during May and June 1968 was 3.8 mg/l. Thisaverage would be 2.2 mg/l if samples taken during periods of high turbulent flow were omitted. 27% of the samples had less than 2.0 mg/l dissolved oxygen with a minimum of 1.15 mg/l.

BOD mg/l

Single Daily Value or Average *Not more than 10.0*

46% of the samples had a BOD greater than 10.0 mg/l with a maximum of 19 mg/l.

Ammonia Nitrogen (N) mg/l

Single Daily Value or Average *Not more than 1.5*

87% of the samples had more than 1.5 mg/l ammonia nitrogen with a maximum of 5.5 mg/l.

Cyanides (CN) mg/l

Single Daily Value or Average *Not more than 0.025*

Two of the 15 samples had a cyanide concentration of 0.04 mg/l.

WATER QUALITY - TABLE 8

STATION 8 - LITTLE CALUMET RIVER AT WENTWORTH AVE.

Parameter		Jul-Dec 1965			Jan-Dec 1966			Jan-Dec 1967			Jan-June 1968			Criteria*		
		Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
Temp	°C	24	0	13	30	0	11	24	0	11	21	0	12	32.2		
Tot.Coli. per	100 ml	3900M	69M	761M	2200M	1000	348M	6200M	2000	362M	1100M	1700	254M	5000		
Fec. Strep "	" "	169M	100	24M	160M	100	11M	75M	140	8000	55M	100	13,700	500		
Fec. Coli "	" "	-	-	-	370M	2000	70M	2000M	1500	100M	200M	800	54,700			
pH		8.8	7.1	-	8.1	6.9	-	8.9	6.7	-	7.9	6.6	-			6.5-9.
Diss. Oxygen	mg/1	9.8	0.0	3.3	11.0	0.1	5.0	11.8	0.0	5.5	10.85	1.15	5.19		2.0	(med) 4.0 (May-Sep
BOD	"	35	3.9	11	17	3.9	8.1	30	4.1	9.7	19	5.6	10.4	10		
COD	"	151	5.9	51	89	19	45	76	13	44	-	-	-			
Chlorides	"	-	-	-	80	17	47	90	13	49	70	21	43			
Sulfate	"	310	57	175	325	100	201	480	30	180	-	-	-			
NH_3-N	"	3.7	.30	2.0	6.0	0.30	2.0	9.8	0.3	2.5	5.5	0.5	3.1	1.5		
NO_2-NO_3-N	"	5.4	.04	1.7	9.3	.10	1.7	3.9	.02	1.7	4.1	0.36	2.4			
Org.Nitrogen	"	6.2	.13	2.6	7.2	0.3	1.7	3.8	0.1	1.7	2.2	0.8	1.2			
Tot. Phos.	"	4.65	.359	1.50	3.59	.071	1.60	6.20	.391	2.04	2.58	0.13	1.39			
Sol. Phos.	"	3.16	.085	1.00	3.22	.055	1.24	5.71	.150	1.43	2.08	0.10	1.11			
MBAS	"	-	-	-	.86	.15	.38	1.3	.19	.54	0.57	0.11	0.28	0.5		
Tot. Iron	"	3.8	.45	1.3	3.1	.38	.87	32.0	.28	2.4	-	-	-			
Phenol	ug/1	59	0	11	65	.24	11	42	0.3	9	89	0	11	20		
Color	units	-	-	-	-	-	-	-	-	-	70	8	22	50		25
Cyanide	mg/1	.18	0.0	.01	.66	0.0	.02	.05	0.0	.01	0.04	0.00	0.01	0.025		
Susp. Solids	"	704	10	106	980	5	64	856	7	64	326	13	48			
Diss. Solids	"	770	109	565	907	194	623	865	204	604	826	420	645			
Conductivity	umho/cm	-	-	-	1300	425	931	1360	345	860	1180	360	912			
Turbidity	units	-	-	-	103	1.0	12	470	1.4	27	310	8	34			
No. of samples			25			50			44			15				

*Calumet Area Enforcement Conference - Criteria 4

WATER QUALITY - TABLE 8A

MEDIAN VALUES - STATION No. 8

LITTLE CALUMET RIVER AT WENTWORTH AVE.

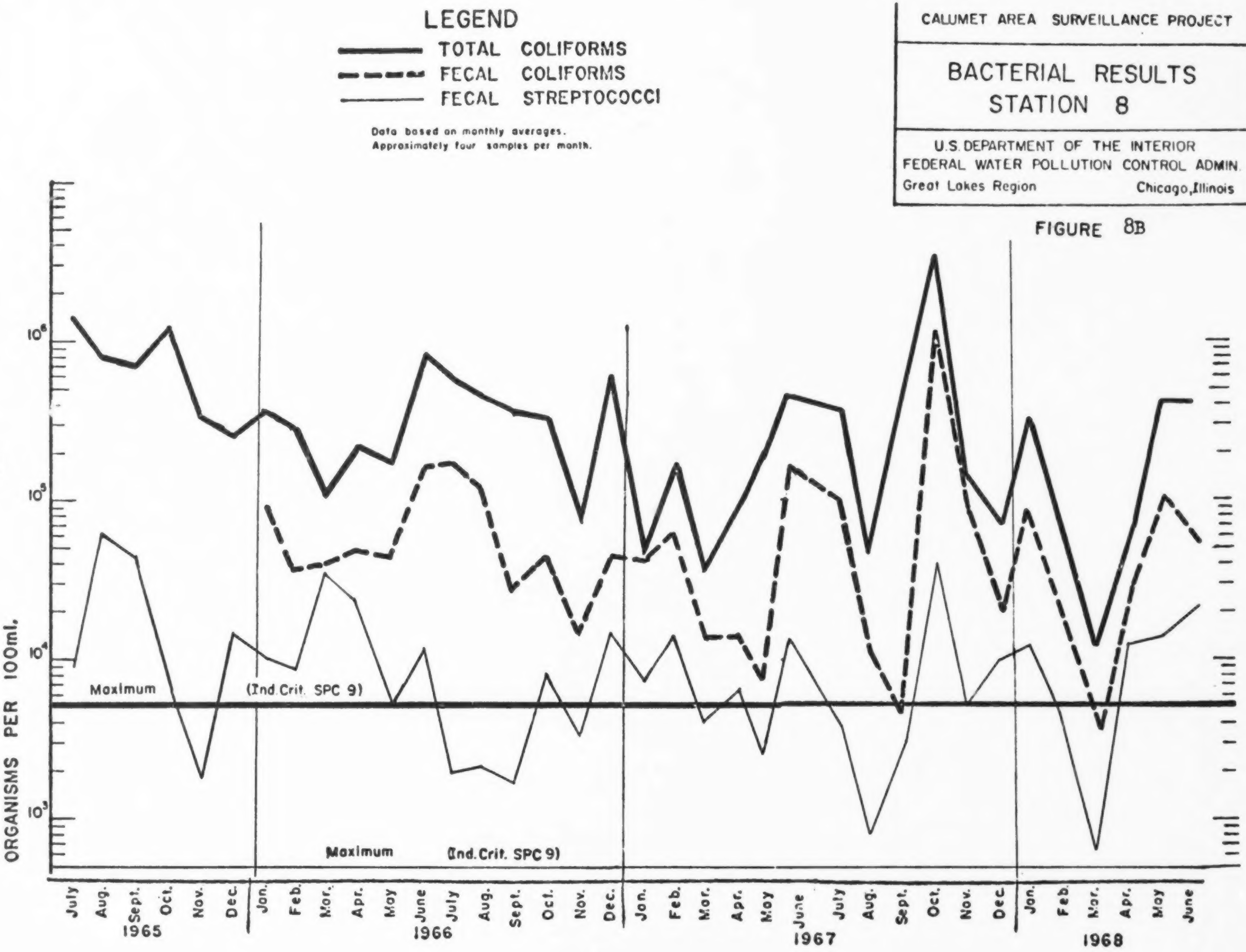
Parameter		July-Dec 1965	Jan-June 1966	July-Dec 1966	Jan-June 1967	July-Dec 1967	Jan-June 1968
Water Temp.	°C	17	7	14	7	18	12
Air Temp.	°C	18	7	15	6	17	15
Tot. Coli.	per 100 ml	380,000	110,000	90,000	65,000	70,000	29,000
Fec. Strep	" " "	6000	6000	2800	5000	5000	900
Fec. Coli	" " "	-	36,000	25,000	20,000	27,000	6000
pH		7.4	7.5	7.5	7.2	7.8	7.5
Dis. Oxygen	mg/l	3.1	7.3	2.5	6.7	3.5	5.5
BOD	"	8.1	7.8	8.5	7.2	7.5	9.4
COD	"	51	39	50	46	36	-
Chlorides	"	-	44	54	39	45	42
Sulfate	"	175	180	205	170	170	-
NH_3-N	"	2.05	1.4	2.4	1.3	3.5	3.3
NO_2-NO_3-N	"	1.4	1.8	0.6	2.0	0.2	2.2
Org. Nitrogen	"	1.6	1.4	1.5	1.7	1.6	1.1
Tot. Phos.	"	1.4	.98	2.1	.91	2.25	1.42
Sol. Phos.	"	0.95	0.52	1.9	.59	1.7	0.77
Tot. Iron	"	0.91	.91	0.63	1.7	0.77	-
Phenol	ug/l	7.9	9.3	6.1	9	5	4
Cyanide	mg/l	0.0	0.00	0.00	0.0	0.0	0.01
Susp. Solids	"	30	32	18	39	27	31
Dis. Solids	"	637	570	741	545	672	620
MBAS	"	-	0.25	0.42	0.33	0.65	0.26
Conductivity	umho/cm	-	765	1100	805	890	980
Turbidity	units	-	9.0	4.0	17	9	14
Color	"	-	-	-	-	20	25
Number of samples		25	24	26	26	18	15

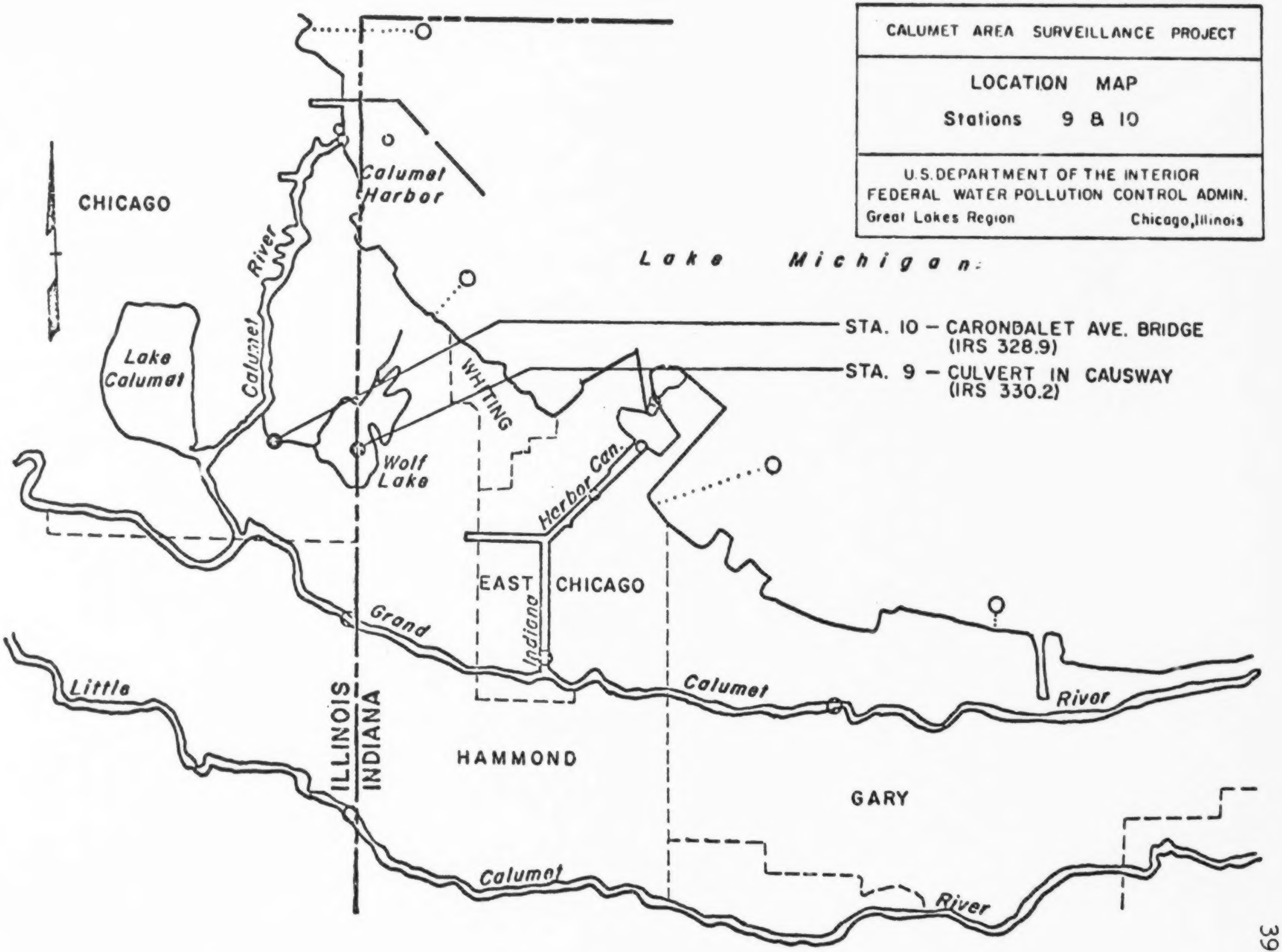
CALUMET AREA SURVEILLANCE PROJECT

BACTERIAL RESULTS
STATION 8

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

FIGURE 8B





CALUMET AREA SURVEILLANCE PROJECT

LOCATION MAP

Stations 9 & 10

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

STA. 10 – CARONDALET AVE. BRIDGE (IRS 328.9)

STA. 9 – CULVERT IN CAUSWAY (IRS 330.2)

Stations 9 and 10 - Wolf Lake and Outlet

Wolf Lake, which is located on the Indiana-Illinois state line, has been sampled at two points. Station 10 is located on the Wolf Lake Outlet at Carondolet Ave. about 3000 feet downstream from Wolf Lake and monitors the quality of the water leaving the lake. Station 9 is directly on the state line which runs along a causeway that bisects the lake. This station monitors the quality of the water crossing the state line and has been established as a control point by the Calumet Area Technical Committee. The criteria developed by the Technical Committee for this point are identical to those adopted by the States of Indiana (Indiana Regulation SPC 10) and Illinois (Rules and Regulations SWB 7 - Rule 1.04).

Wolf Lake is a high quality body of water that is extensively used for fishing, boating, swimming and all forms of water associated recreation. On the Indiana side there is a popular public beach at 121st Street in Hammond and on the Illinois side there is a game preserve and extensive park areas used for picnics, fishing and other activities. During the spring and fall seasons large numbers of migratory water fowl use the lake as a refuge.

The overall quality of the lake was good in 1965 and in 1968 is still good enough for all uses. Figure 9B on page 63 shows that the bacterial quality of the lake is good, meeting the criteria on all occasions during 1968. The dissolved oxygen concentrations met stringent criteria (see table 9 on page 59) but the ominous signs of eutrophication became more pronounced in 1968 than ever before. Samplers often reported large algal blooms throughout the lake, foam was frequently observed on the surface and, during May and June, large blobs of putrescent material rose from the bottom of the northernmost arm of the lake and created an unsightly mess on the shores and surface. Figure 9C on page 65 shows that the concentration of phosphorus in the lake has increased steadily since 1965 and is far above the level permitted by the criteria.

The area drained by Wolf Lake is very small and most of the flow entering the lake comes from the Lever Brothers Company which pumps water from Lake Michigan, uses it, and discharges it to Wolf Lake. Lesser sources are waste from the American Maize Company and some storm sewers on Indianapolis Boulevard. All of these flows are discharged into the northern arm of the lake where the signs of deterioration are the most severe. The discharge from Lever Brothers has done much to keep the lake from becoming stagnant by providing a flow through it and the state reports that the company has made serious attempts to reduce the waste loads to the lake but, unless action is taken to reduce the amount of phosphorus reaching the lake, its value as a recreational area will be greatly reduced during the next several years.

On May 16, 1967 the concentration of phenolic compounds in the lake increased from its normal level of less than 5 ug/l to 57 ug/l and did not subside until June. On May 31, 1967 a discharge of dark brown material was observed coming from the outfall of the storm sewer on the south side of Indianapolis

Boulevard. This outfall was sampled and 74 ug/l of phenol was found. Since then higher than normal phenol concentrations have been found on three separate occasions. Phenol is toxic and can taint the flesh of fish. The source of these discharges should be found and they should be eliminated even though phenol is not one of the pollutants covered by the criteria.

The following provisions of the criteria (Indiana Regulation SPC 10 and Illinois Rules and Regulations SWB 7 - Rule 1.04) were violated during the first six months of 1968:

True Color - units

Annual Average	*Not more than 5*
Single Daily Value or Average	*Not more than 15*

The average for the first six months of 1968 was 6 units and one sample had 25 units of true color.

Ammonia Nitrogen (N) mg/l

Annual Average	*Not more than 0.05*
Single Daily Value or Average	*Not more than 0.12*

The average ammonia concentration for the first six months of 1968 was 0.07 mg/l and one sample had 0.18 mg/l ammonia.

Methylene Blue Active Substance mg/l

Annual Average	*Not more than 0.02*
Single Daily Value or Average	*Not more than 0.05*

The average for the first six months of 1968 was 0.14 mg/l. 100% of the samples had MBAS concentrations greater than 0.05 mg/l with a maximum of 0.33 mg/l.

Total Phosphates (PO_4) mg/l

Annual Average	*Not more than 0.03*
Single Daily Value or Average	*Not more than 0.04*

The average phosphate (PO4) concentration during the first six months of 1968 was 0.28 mg/l. 100% of the samples had phosphorus concentrations exceeding 0.04 mg/l with a maximum of 0.52 mg/l.

WATER QUALITY - TABLE 9

STATION 9 - WOLF LAKE AT INDIANA-ILLINOIS STATE LINE CULVERT

Parameter		Oct -Dec 1965			Jan-Dec 1966			Jan-Dec 1967			Jan-June 1968			Criteria*		
		Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
Temp	°C	15	0	4	29	0	11	25	0	11	21	0	13	29.5		
Tot.Coli.	per 100 ml	5400	5	960	4300	2	355	4000	4	253	220	5	103	5000		
Fec. Strep	" " "	220	1	47	1200	1	41	190	2	18	125	5	17	100		
Fec. Coli	" " "	-	-	-	950	1	38	700	2	34	30	5	8			
pH		8.2	7.7	-	9.8	7.4	-	9.6	6.9	-	8.8	6.8	-			7.0-9.0
Diss. Oxygen	% sat.	106	72	95	115	62	93	106	70	89	99	80	91		80	(med) 90
BOD	mg/1	5.5	1.2	3.2	11	1.6	4.7	8.9	2.5	4.8	-	-	-			
COD	"	134	6.4	42	55	10	25	69	14	28	-	-	-			
Chlorides	"	-	-	-	38	20	28	38	20	29	-	-	-			
Sulfate	"	60	46	50	69	37	51	70	22	47	-	-	-			
NH_3-N	"	.38	.07	.24	.56	.02	.25	.73	.02	.20	0.18	0.02	0.07	.12		.05
NO_2-NO_3-N	"	.86	.38	.58	1.2	.03	.36	0.5	0.0	.19	0.27	0.00	0.10			
Org.Nitrogen	"	1.00	.45	.69	2.0	.51	.98	13.0	.50	1.3	2.0	0.52	1.21			
Tot. Phos.	"	.098	.020	.042	.111	.013	.050	.137	.023	.060	0.17	0.01	0.09	.013		.010
Sol. Phos.	"	.094	.006	.033	.104	.013	.036	.117	.013	.038	0.09	0.01	0.06			
MBAS	"	-	-	-	.19	.09	.13	.30	.07	.14	0.33	0.06	0.14	.05		.02
Tot. Iron	"	.97	.08	.28	.74	.04	.25	1.6	.05	.42	-	-	-			
Phenol	ug/1	20	0.0	4	19	0.0	3.2	57	0	5	23	0	5			
Turbidity	units	-	-	-	12	0.5	3.5	18	0.6	8	19	5	12			
Cyanide	mg/1	.01	0.0	0.0	.35	0.0	.01	.01	0.0	0.0	0.00	0.00	0.00	.025		
Susp. Solids	"	51	2	11	48	4	14	65	2	15	40	8	24			
Diss. Solids	"	285	255	264	320	180	249	342	197	250	297	211	264			
Conductivity	umho/cm	-	-	-	500	335	400	510	330	395	500	340	442			
Color	units	-	-	-	-	-	-	-	-	-	25	2	6	15		5
No. of samples			11			52			43			14				

* Calumet Area Enforcement Conference - Criteria 6

WATER QUALITY - TABLE 9A

MEDIAN VALUES - STATION No. 9
WOLF LAKE AT CULVERT - ILL.-IND. STATE LINE

Parameter		Oct-Dec 1965	Jan-June 1966	July-Dec 1966	Jan-June 1967	July-Dec 1967	Jan-June 1968
Water Temp.	°C	1	5	12	7	15	13
Air Temp.	°C	4	6	15	8	16	16
Tot. Coli.	per 100 ml	180	60	170	50	120	60
Fec. Strep	" " "	10	9	10	2	6	10
Fec. Coli	" " "	-	6	8	2	10	5
pH		7.9	8.0	8.1	7.8	8.3	8.0
Dis. Oxygen	mg/1	13.0	11.2	10.5	10.5	9.6	9.6
BOD	"	3.4	3.7	6.0	4.1	6.3	-
COD	"	23	18	30	25	29	-
Chlorides	"	-	30	27	31	24	-
Sulfate	"	50	55	46	53	43	-
NH_3-N	"	0.22	0.30	0.20	0.35	0.04	0.06
NO_2-NO_3-N	"	0.55	0.30	0.26	0.29	0.04	0.10
Org. Nitrogen	"	0.68	0.71	1.1	1.0	0.94	1.1
Tot. Phos.	"	0.04	0.03	.06	0.05	0.07	0.09
Sol. Phos.	"	0.03	.02	0.05	0.03	0.04	0.07
Tot. Iron	"	0.23	.22	0.24	0.33	0.42	-
Phenol	ug/1	4	2	3	3	1	3
Cyanide	mg/1	0.00	0.00	0.00	0.00	0.00	0.00
Susp. Solids	"	9	9	14	11	12	20
Dis. Solids	"	265	265	225	265	247	265
MBAS	"	-	.11	0.14	0.12	0.12	0.14
Conductivity	umho/cm	-	400	385	400	375	455
Turbidity	units	-	2.1	4.0	7.0	10	15
Color	"	-	-	-	-	0	3
No. of samples		11	26	26	25	18	14

WATER QUALITY - TABLE 10

STATION 10 - WOLF LAKE OUTLET AT CARONDOLET AVE.

Parameter		Oct -Dec 1965			Jan-Dec 1966			Jan-Dec 1967			Jan-June 1968			Criteria*		
		Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
Temp	°C	16	1	5	28	0	11	24	0	10	21	0	13	29.5		
Tot.Coli. per	100 ml	1500	1	410	2900	5	650	6500	5	670	9500	5	1300	5000		
Fec. Strep "	" "	220	1	65	700	1	120	1000	2	118	2200	5	200	100		
Fec. Coli "	" "	-	-	-	2400	2	190	1500	2	130	520	5	72			
pH		8.6	8.1	-	8.8	7.9	-	8.9	7.4	-	9.3	6.5	-			7.0-9.0
Diss. Oxygen	% sat.	99	68	89	100	68	86	97	72	86	99	63	83		80	(med) 90
BOD	mg/1	2.6	1.7	2.2	7.6	1.9	3.0	24	0.5	4.5	-	-	-			
COD	"	138	0.8	32	38	11	22	38	11	22	-	-	-			
Chlorides	"	-	-	-	42	26	34	42	21	33	-	-	-			
Sulfate	"	72	45	64	92	52	73	79	29	60	-	-	-			
NH_3-N	"	.33	.06	.20	.67	.01	.23	.78	.02	.19	0.39	0.05	0.14	.12		.05
NO_2-NO_3-N	"	.60	.12	.30	.67	.01	.30	.97	0.0	.20	0.44	0.01	0.17			
Org.Nitrogen	"	.83	.44	.58	1.1	.28	.70	1.0	0.31	.65	0.79	0.37	0.59			
Tot. Phos.	"	.160	.016	.026	.088	.010	.026	.095	.016	.029	0.19	0.004	0.03	.013		.010
Sol. Phos.	"	.078	.007	.016	.036	.007	.018	.049	.007	.021	0.03	0.003	0.02			
MBAS	"	-	-	-	.24	.08	.13	.44	.05	.14	0.20	0.06	0.14	.05		.02
Tot. Iron	"	.37	.04	.22	.77	.05	.19	1.5	.07	.41	-	-	-			
Phenol	ug/1	8	0	4	20	1	6	30	0	9	34	1	7			
Turbidity	units	-	-	-	-	-	-	-	-	-	12.6	1.4	7.8			
Cyanide	mg/1	0.0	0.0	0.0	.02	0.0	0.0	-	-	-	-	-	-	.025		
Susp. Solids	"	24	2	13	65	2	21	50	2	17	27	14	19			
Diss. Solids	"	305	245	281	343	172	274	315	214	263	293	332	277			
Conductivity	umho/cm	-	-	-	545	350	450	550	260	408	480	385	444			
Color	units	-	-	-	-	-	-	-	-	-	12	0	4	15		5
No. of samples			11			52			43			15				

* Calumet Area Enforcement Conference - Criteria 6

WATER QUALITY - TABLE 10A
MEDIAN VALUES - STATION No. 10
WOLF LAKE CHANNEL AT CARONDOLET AVE.

Parameter		Oct-Dec 1965	Jan-June 1966	July-Dec 1966	Jan-June 1967	July-Dec 1967	Jan-June 1968
Water Temp.	°C	3	5	13	7	24	13
Air Temp.	°C	5	7	15	8	16	16
Tot. Coli.	per 100 ml	110	150	750	100	670	50
Fec. Strep	" " "	35	19	70	14	65	30
Fec. Coli	" " "	-	11	110	10	100	10
pH		8.4	8.5	8.4	8.3	8.4	8.4
Dis. Oxygen	mg/l	12.0	11.4	9.7	10.6	8.2	8.85
BOD	"	2.1	3.3	2.8	3.3	2.3	-
COD	"	20	18	27	23	19	-
Chlorides	"	-	35	32	35	30	-
Sulfate	"	66	77	68	68	55	-
NH_3-N	"	0.21	0.28	0.18	.25	0.11	0.11
NO_2-NO_3-N	"	0.26	0.34	0.21	.34	0.02	0.16
Org. Nitrogen	"	0.55	0.62	0.74	.70	0.54	0.59
Tot. Phos.	"	0.03	0.02	0.03	.03	0.03	0.03
Sol. Phos.	"	0.02	0.02	0.02	.02	0.02	0.02
Tot. Iron	"	0.22	0.23	0.15	.30	0.21	-
Phenol	ug/l	3	8.0	3.5	12	5	4
Cyanide	mg/l	0.0	0.0	0.00	-	-	-
Susp. Solids	"	15	24	14	16	14	20
Dis. Solids	"	280	295	260	280	249	279
MBAS	"	-	.12	.13	.12	.14	0.16
Conductivity	umho/cm	-	-	-	422	390	445
Turbidity	units	-	-	-	-	6.4	11
Color	"	-	-	-	-	0	3
No. of samples		11	26	26	25	18	15

CALUMET AREA SURVEILLANCE PROJECT

BACTERIAL RESULTS
STATION 9

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

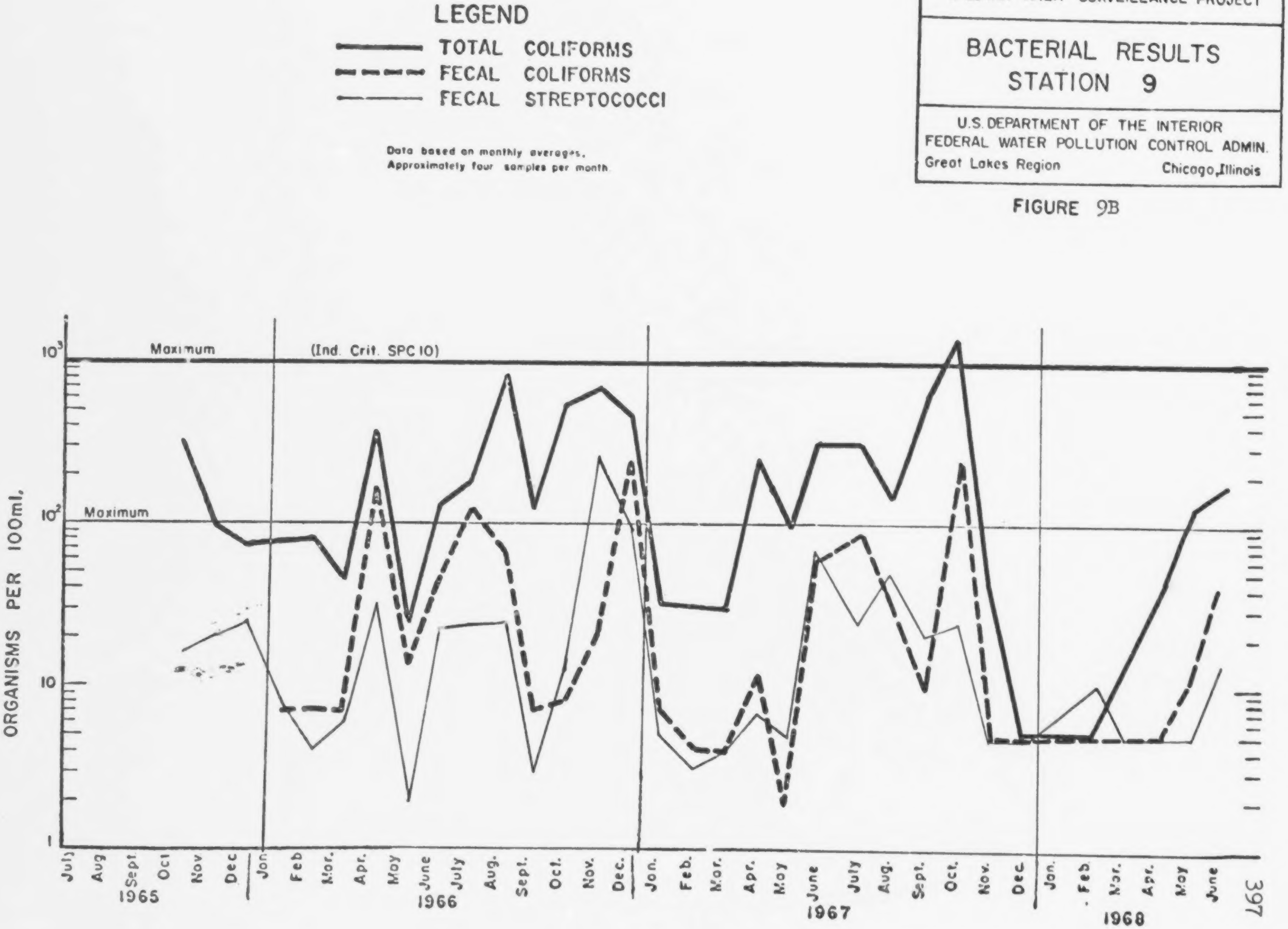
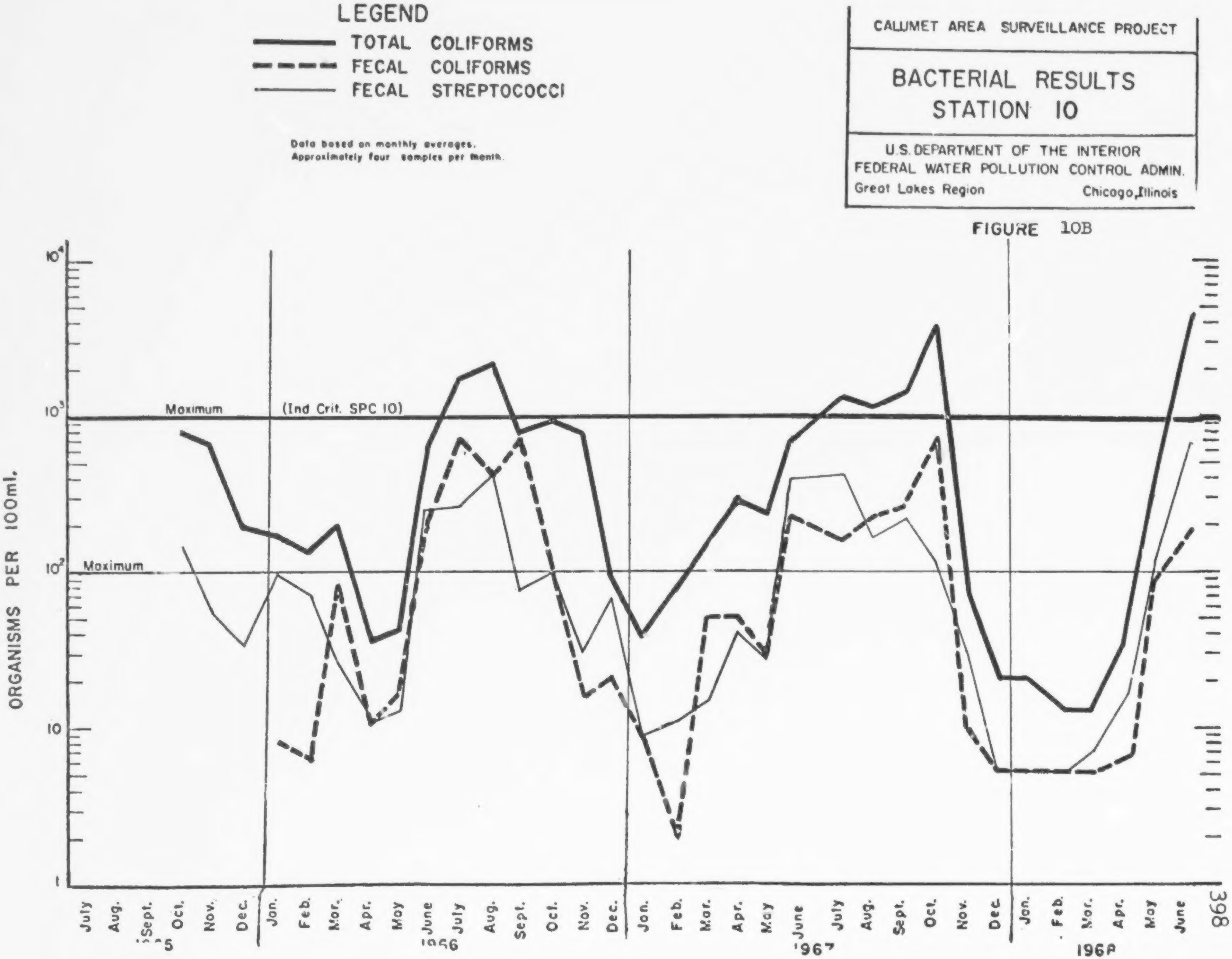


FIGURE 9B



CALUMET AREA SURVEILLANCE PROJECT

BACTERIAL RESULTS
STATION 10

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

FIGURE 10B

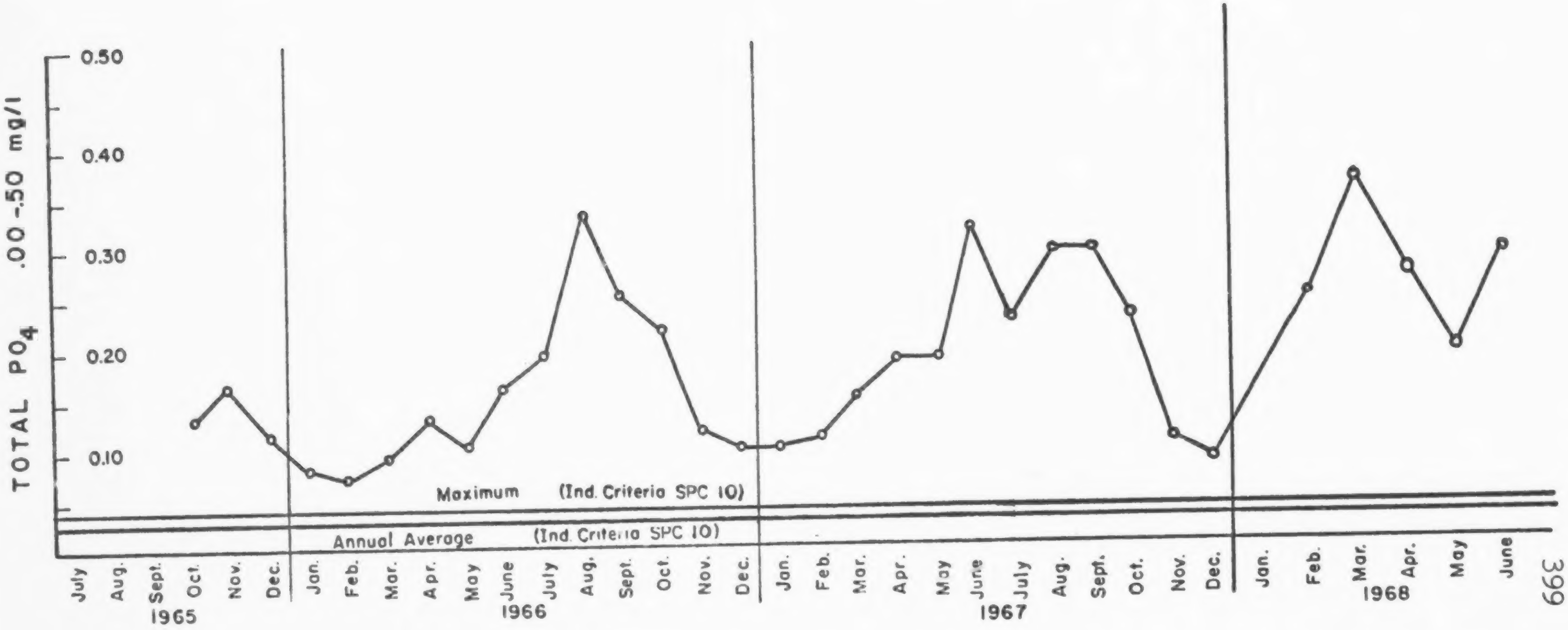
CALUMET AREA SURVEILLANCE PROJECT

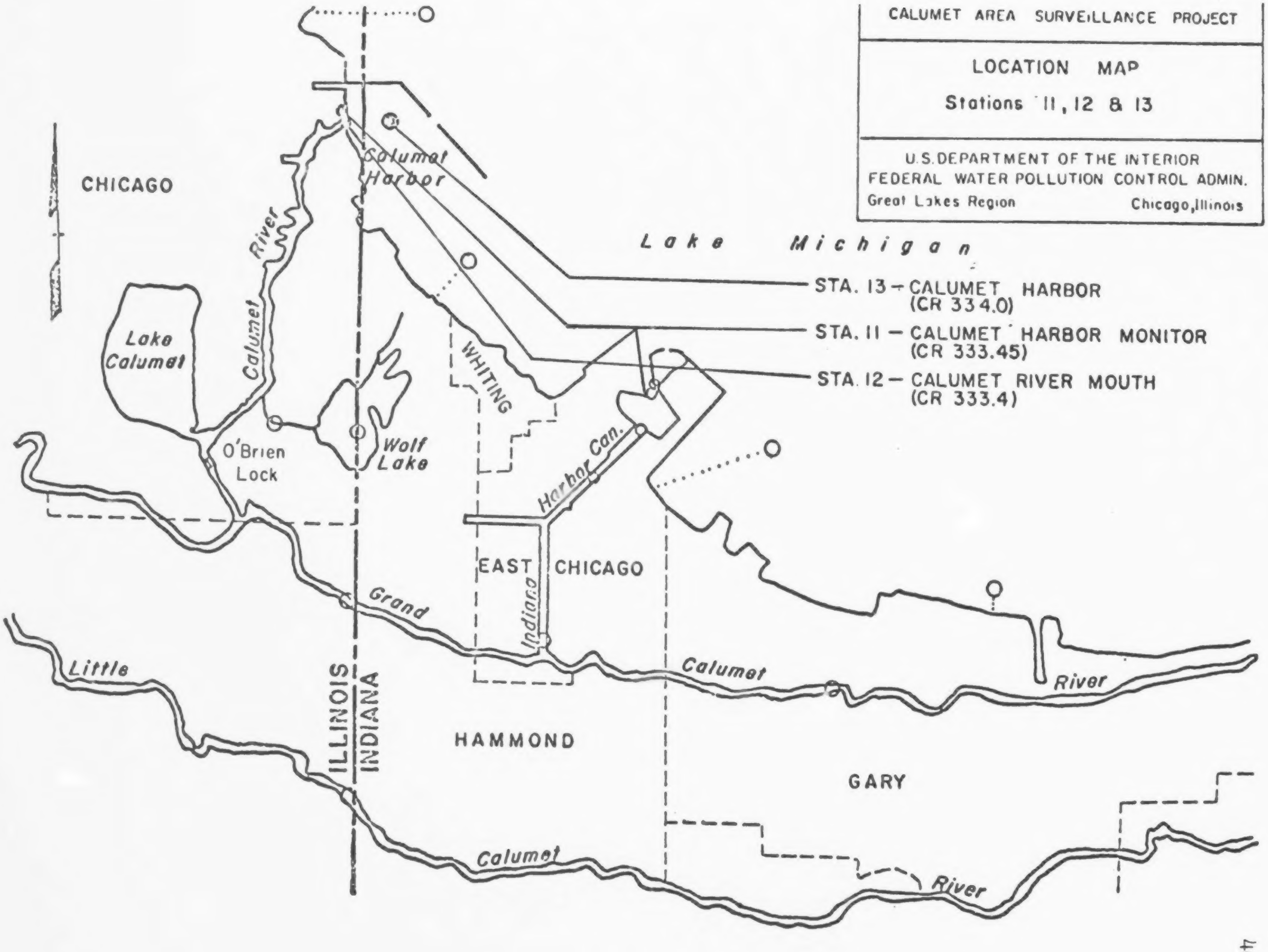
CHEMICAL RESULTS
STATION 9
Wolf Lake
at State Line

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

Figure 9C

Data based on monthly averages.
Approximately four samples per month.




CALUMET AREA SURVEILLANCE PROJECT
LOCATION MAP
Stations 11, 12 & 13
U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region
Chicago, Illinois
Lake Michigan
STA. 13 – CALUMET HARBOR (CR 334.0)
STA. 11 – CALUMET HARBOR MONITOR (CR 333.45)
STA. 12 – CALUMET RIVER MOUTH (CR 333.4)
CHICAGO
Calumet Harbor
Calumet River
Lake Calumet
O'Brien Lock
Wolf Lake
WHITING
Harbor Can.
EAST CHICAGO
Indiana
Grand
Calumet
River
ILLINOIS
INDIANA
HAMMOND
GARY
Little
Calumet
River

Stations 11, 12 and 13 - Calumet Harbor

Calumet Harbor was sampled at three points. Station 11 is located at the mouth of the Calumet River immediately adjacent to the north pierhead light. Station 12 was located at the mouth of the Calumet River at midstream. The purpose of these stations was to monitor the quality of the water entering the river from the harbor. Station 13 is located in mid-harbor approximately 3500 feet from the mouth of the river. This station monitors the quality of the water flowing from Lake Michigan to the river. Stations 12 and 13 require a boat for sampling and,therefore, can be sampled only when the weather permits. A comparison of data from Stations 11 and 12 revealed that they are essentially the same in terms of water quality. Therefore, sampling at Station 12 was discontinued during July 1967.

The diversion of water through the Sag Channel and the operation of O'Brien Lock causes the lower end of the Calumet River to act as an estuary with the net flow from Lake Michigan toward the lock. Under these conditions water flows from the lake to the river most of the time. For this reason it can be stated that most of the pollution in the harbor and at the river mouth originates in the immediate area.

No criteria have been established that apply specifically to these points, but the criteria for Lake Michigan Inner Harbor Basins developed by the Calumet Area Technical Committee can reasonably be applied and are used for comparison purposes.

The bacterial quality of the harbor and river mouth is generally satisfactory. During 1968 the maximum of 5000 coliforms per 100 ml was not violated at either station. The maximum of 100 fecal streptococci per 100 ml was violated only once at Station 11 and not at all at Station 13. Figures 11B and 13B on pages 73 and 74 show that the coliform counts have almost always been within the criteria but that the fecal streptococci counts have been higher than the criterion about 30% of the time. This indicates that the general level of contamination is low, that its source is human or animal wastes and that it is reasonably fresh. The only source that fits these facts is wastes from boats and shipping that use the harbor.

The chemical quality of the water at Station 13 met all of the criteria except for the criteria on ammonia nitrogen.

The mouth of the river at Station 11 is frequently affected by wastes from the United States Steel Corporation's South Works which are discharged to the harbor from outfalls approximately 2000 feet north of the mouth. The water around Station 11 is frequently discolored by iron from the outfalls and criteria for turbidity, surface oil, dissolved oxygen, ammonia nitrogen, phenol and phosphorus were violated during the first six months of 1968.

Samples from Station 11 were composited on a monthly basis and analyzed for heavy metals. The following table compares average values for six-month periods:

	Jan-June'67	July-Dec'67	Jan-June'68
Copper	0.04 mg/l	0.03 mg/l	0.04 mg/l
Chromium (total)	less than 0.005 mg/l	0.007 mg/l	0.03 mg/l
Potassium	3.9 mg/l	2.1 mg/l	2.6 mg/l
Manganese	0.22 mg/l	0.13 mg/l	0.18 mg/l
Lead	0.04 mg/l	0.03 mg/l	0.06 mg/l
Nickel	0.03 mg/l	0.01 mg/l	0.003 mg/l
Zinc	0.09 mg/l	0.06 mg/l	0.04 mg/l
Sodium	8 mg/l	4.8 mg/l	6.7 mg/l
Arsenic	-	-	21 ug/l

This data shows no consistent changes with time. The apparent increase in chromium is due to one sample in February 1968 which had a value of 0.10 mg/l. The other five samples had chromium concentrations comparable with previous data. Several samples from Station 13 were also analyzed for heavy metals. The results show that concentrations of potassium, manganese and chromium are significantly higher at the river mouth than in the middle of the harbor.

Special sampling done during November 1967 in the Calumet River near Torrence Avenue shows that the water quality is considerably lower than near the mouth. Mean concentrations of 0.86 mg/l organic nitrogen, 2.5 mg/l ammonia nitrogen, 0.92 mg/l nitrate nitrogen, 0.107 mg/l total phosphorus, 304 mg/l dissolved solids, and 20 Jackson Candle Units of turbidity were found in the river water. These values are considerably higher than those found at the mouth during 1967. See Table 11, page 69.

The special study also found the bottom sediments to be heavily polluted when compared with bottom sediments from other harbors on Lake Michigan.

WATER QUALITY - TABLE 11

STATION 11 - CALUMET RIVER AT MOUTH

Parameter		Aug - Dec 1965 Max	Min	Mean	Jan-Dec 1966 Max	Min	Mean	Jan-Dec 1967 Max	Min	Mean	Jan-June 1968 Max	Min	Mean	Criteria* Max	Min	Mean
Temp	°C	22	3	14	26	0	11	21	0	11	19	1	11	29.5		
Tot. Coli. per	100 ml	7200	42	1600	30M	30	1500	16M	50	1100	4600	20	690	5000		2000
Fec. Strep "	" "	162	0	43	3900	4	150	1300	0	100	920	5	80	100		
Fec. Coli "	" "	-	-	-	18M	1	520	1000	0	150	580	5	90			
pH		8.0	7.5	-	8.3	7.3	-	8.4	6.7	-	8.8	6.8	-	9.0	7.5	8.0-8.5 (med)
Diss. Oxygen	% sat	99	75	85	98	43	80	101	20	75	102	75	90		65	80
BOD	mg/1	3.7	1.0	1.9	5.6	0.9	2.6	6.4	0.2	4.1	-	-	-			
COD	"	120	.9	29	42	0.7	13	28	4	13	-	-	-			
Chlorides	"	-	-	-	25	9	11	33	7	14	-	-	-	30		18
Sulfate	"	26	17	23	38	16	27	58	9	28	41	7.0	23	75		36
NH_3-N	"	.39	.15	.20	1.1	.12	.42	4.4	.12	.60	1.1	0.06	0.26	.12		.05
NO_2-NO_3-N	"	.41	.17	.23	.70	.09	.22	0.78	0.0	.21	0.43	0.15	0.26			
Org. Nitrogen	"	.60	.04	.24	.70	.03	.32	1.00	0.10	.38	0.75	0.06	0.29			
Tot. Phos.	"	.075	.007	.023	.359	.013	.059	.156	.010	.048	0.25	0.004	0.05	.033		.016
Sol. Phos.	"	.081	.007	.036	.059	.007	.016	.033	.006	.014	0.11	0.002	0.03			
Dis. Iron	"	-	-	-	-	-	-	-	-	-	0.24	0.0	0.08			
Tot. Iron	"	2.3	.24	.84	97.	.09	7.7	55.0	0.2	7.2	26	0.4	4.2			
Phenol	ug/1	8.2	0.0	2.3	19	0.0	3.5	131	0	12	15	0	4	5		2
Oil & grease	mg/1	-	-	-	-	-	-	6.8	0	2.3	4.2	0.8	2.5			
Cyanide	"	.01	0.0	0.0	.13	0.0	.01	0.13	0.0	.01	0.09	0.00	0.02	0.1		
Susp. Solids	"	76	2.0	20	191	3	35	239	3	32	127	2	24			
Diss. Solids	"	280	140	180	211	80	177	252	135	187	246	167	186	230		190
Conductivity	umho/cm	-	-	-	410	203	305	440	260	306	400	280	303			
MBAS	mg/1	-	-	-	.22	.02	.08	0.32	0.01	.07	-	-	-			
Turbidity	units	-	-	-	90	0.6	35	43	0.1	11	15	0.1	7.7			
Color	"	-	-	-	-	-	-	-	-	-	7.0	0.0	1.5	15		5
No. of Samples		15 (taken at midstream)			51 (taken at N.Pierhead light)			44 (taken at N.Pierhead Lt.)			15					

* Calumet Area Enforcement Conference - Criteria 2

403

WATER QUALITY - TABLE 11A
MEDIAN VALUES - STATION No. 11
CALUMET RIVER - NORTH PIERHEAD LIGHT

Parameter		Aug-Dec 1965	Jan-June 1966	July-Dec 1966	Jan-June 1967	July-Dec 1967	Jan-June 1968
Water Temp.	°C	140	6	15	9	18	10
Air Temp.	°C	-	-	-	6	18	14
Tot. Coli.	per 100 ml	1100	330	500	500	340	220
Fec. Strep	" " "	40	28	48	35	30	10
Fec. Coli	" " "	-	30	100	60	120	20
pH		7.9	7.8	7.9	7.9	8.0	7.9
Dis. Oxygen	mg/l	8.5	10.4	7.7	8.7	8.2	10.5
BOD	"	2.2	2.2	2.5	2.7	1.8	-
COD	"	12	8.8	15	13	10	-
Chlorides	"	-	12	10	15	10	-
Sulfate	"	23	27	28	30	24	24
NH_3-N	"	0.22	0.46	0.29	0.42	0.28	0.17
NO_2-NO_3-N	"	0.27	0.22	0.19	0.3	0.15	0.26
Org. Nitrogen	"	0.29	0.31	0.29	0.36	0.29	0.26
Tot. Phos.	"	0.03	0.03	0.03	0.05	0.05	0.03
Sol. Phos.	"	0.02	0.01	0.01	0.02	0.01	0.02
Dis. Iron	"	-	-	-	-	-	0.08
Tot. Iron	"	0.72	1.1	2.1	3.2	5.0	2.1
Phenol	ug/l	2.0	2.7	2	5	2	2
Oil & Grease	mg/l	-	-	-	-	-	2.5
Cyanide	"	0.00	0.01	0.00	0.01	0.01	0.01
Susp. Solids	"	18	23	20	30	19	12
Dis. Solids	"	170	185	177	189	177	181
MBAS	"	-	0.05	0.08	0.08	0.05	-
Conductivity	umho/cm	-	300	300	320	290	300
Turbidity	units	-	-	12.5	14.	7.0	4.7
Color	"	-	-	-	-	0	1
No. of samples		15	25	26	26	18	15

WATER QUALITY - TABLE 13

STATION 13 - CALUMET HARBOR

Parameter		Aug- Dec 1965			Apr-Nov 1966			May-Oct 1967			May-June 1968			Criteria*		
		Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
Temp	°C	22	7	15	24	5	16	21	9	17	19	11	16	29.3		
Tot.Coli. per	100 ml	9200	140	1600	2300	6	460	1500	50	450	4300	20	1100	5000		2000
Fec. Strep "	" "	94	0	20	3300	1	7	10	2	4	5	5	5	100		
Fec. Coli "	" "	-	-	-	1400	1	120	590	2	150	490	5	110			
pH		8.0	7.7	7.9	8.1	7.4	-	8.2	7.4	-	8.7	7.9	-	9.0	7.5	8.0-8.5 (med)
Diss. Oxygen	% sat	91	77	87	97	71	85	102	71	85	106	80	96		65%	80%
BOD	mg/1	2.1	1.0	1.5	4.8	1.0	2.3	7.0	0.6	1.8	3.0	1.1	2.1			
COD	"	120	0.0	19	22	2	11	17	3.9	9.3	23	4.5	12.2			
Chlorides	"	-	-	-	14	8	10	15	7	11	8.0	7.2	-	30		18
Sulfate	"	37	19	25	33	16	24	31	20	24	28	20	-	75		36
NH_3-N	"	0.27	0.10	0.19	.48	.04	.28	.40	.03	.21	0.19	0.05	0.13	.12		.05
NO_2-NO_3-N	"	0.53	0.17	0.26	.38	.04	.19	.43	.10	.20	0.34	0.18	0.24			
Org.Nitrogen	"	0.51	0.03	0.25	.56	.06	.28	.93	.23	.38	0.46	0.01	0.23			
Tot. Phos.	"	.254	.007	.046	.033	.013	.020	.033	.013	.027	0.03	0.004	0.01	.032		.016
Sol. Phos.	"	.095	.007	.023	.023	0.0	.010	.026	.007	.015	-	-	-			
Dis. Iron	"	-	-	-	-	-	-	-	-	-	0.33	0.00	0.09			
Tot. Iron	"	1.82	0.09	0.46	2.1	.12	.57	1.10	.26	.55	0.54	0.12	0.32			
Phenol	ug/1	8.0	0.0	1.4	11	0	2	5.8	0	2	2	0	0	5		2
Oil & grease	mg/1	-	-	-	-	-	-	-	-	-	3.4	2.2	2.7			
Cyanide	"	0.01	0.00	0.00	.01	0.0	0.0	.02	0	0.0	0.01	0.00	0.00	0.1		
Susp. Solids	"	19.	1.0	9.	46	2	10	18	1	8	10	2	6			
Diss. Solids	"	195	150	170	210	126	177	200	152	173	187	168	178	230		190
Conductivity	umho/cm	-	-	-	315	270	296	310	260	280	300	270	285			
MBAS	mg/1	-	-	-	.11	.02	.05	.13	.02	.06	0.13	0.04	0.07	.30		.10
Turbidity	units	-	-	-	19.9	0.6	2.7	8.0	0.2	3.3	8.0	0.4	2.8			
Color	"	-	-	-	-	-	-	-	-	-	3	0	1			
No. of Samples			12			29			18			6				

* Calumet Area Conference - Criteria 2

WATER QUALITY - TABLE 13A

MEDIAN VALUES - STATION No. 13

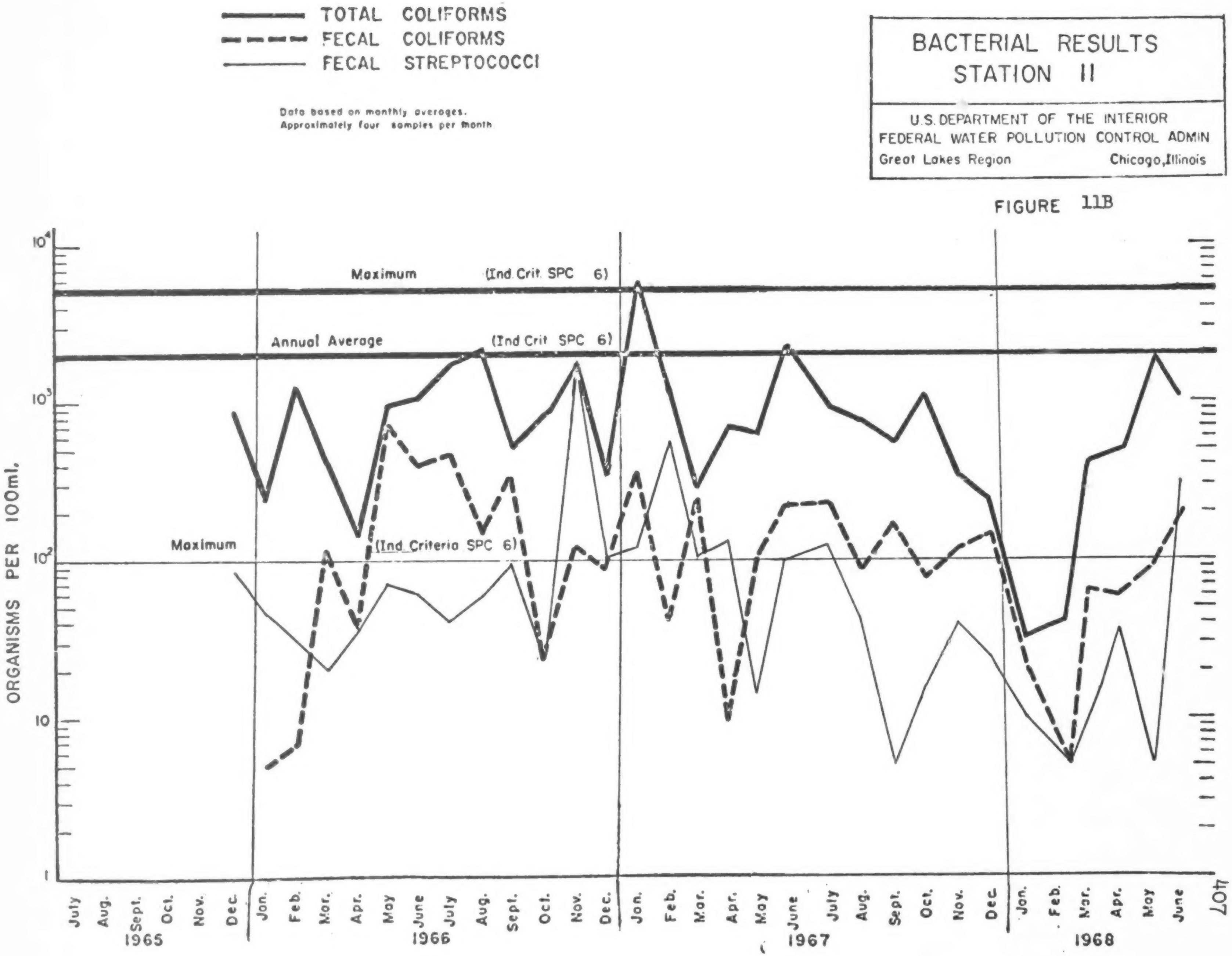
CALUMET HARBOR - MID-CHANNEL

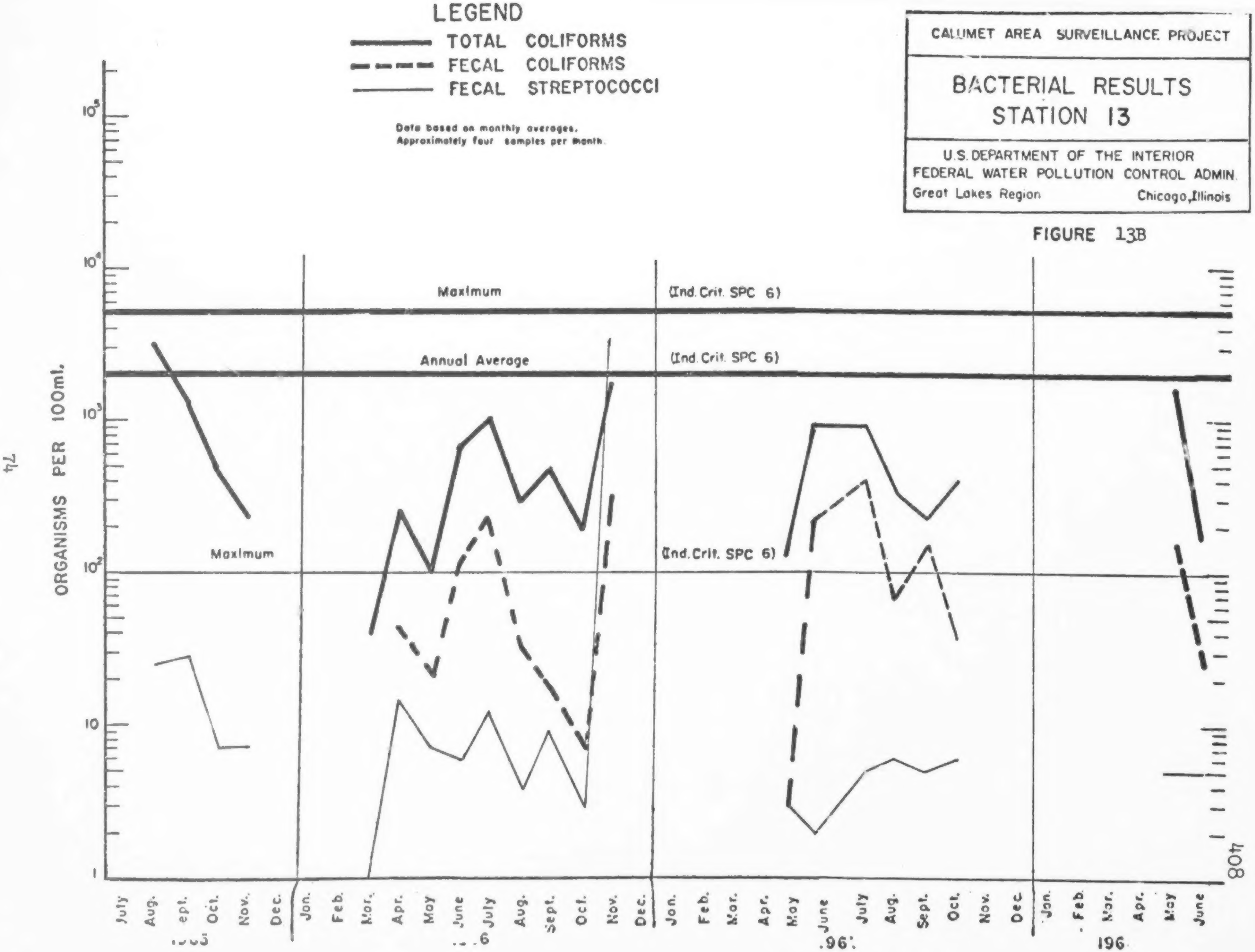
Parameter		Aug-Nov 1965	Apr-June 1966	July-Nov 1966	Jan-June 1967	July-Oct 1967	May-June 1968
Water Temp.	°C	15	14	22	12	20	16
Air Temp.	°C	-	-	-	12	22	19
Tot. Coli.	per 100 ml	530	200	320	175	450	200
Fec. Strep	" " "	10	4	4	<2	5	5
Fec. Coli	" " "	-	70	20	4	100	10
pH		7.9	7.8	7.8	8.1	7.9	8.1
Dis. Oxygen	mg/1	9.0	9.2	7.7	9.7	7.7	9.75
BOD	"	1.6	2.3	2.0	2.0	1.6	2.1
COD	"	7.6	10	14	12	7.7	8.3
Chlorides	"	-	11	10	12	10	-
Sulfate	"	24	25	25	31	23	-
NH_3-N	"	0.2	0.33	0.24	0.28	0.18	0.14
NO_2-NO_3-N	"	0.24	0.16	0.19	0.37	0.13	0.26
Org. Nitrogen	"	0.22	0.39	0.23	0.4	0.33	0.27
Tot. Phos.	"	0.03	0.02	0.02	.03	0.03	0.01
Sol. Phos.	"	0.02	0.01	0.01	.02	0.01	-
Dis. Iron	"	-	-	-	-	-	0.04
Tot. Iron	"	0.21	0.48	0.47	.48	0.6	0.35
Phenol	ug/1	0.9	0.0	2	5	1	0.0
Oil & Grease	mg/1	-	-	-	-	-	2.7
Cyanide	"	0.00	0.00	0.00	0.00	0.00	0.0
Susp. Solids	"	8.0	9	7	6	8	7
Dis. Solids	"	170	185	167	180	170	178
MBAS	"	-	.04	.06	.09	.04	-
Conductivity	umho/cm	-	300	295	305	275	280
Turbidity	units	-	3.4	1.6	6.0	2.7	2.7
Color	"	-	-	-	-	-	1
No. of samples		12	12	17	5	13	6

BACTERIAL RESULTS
STATION II

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN
Great Lakes Region Chicago, Illinois

FIGURE 11B



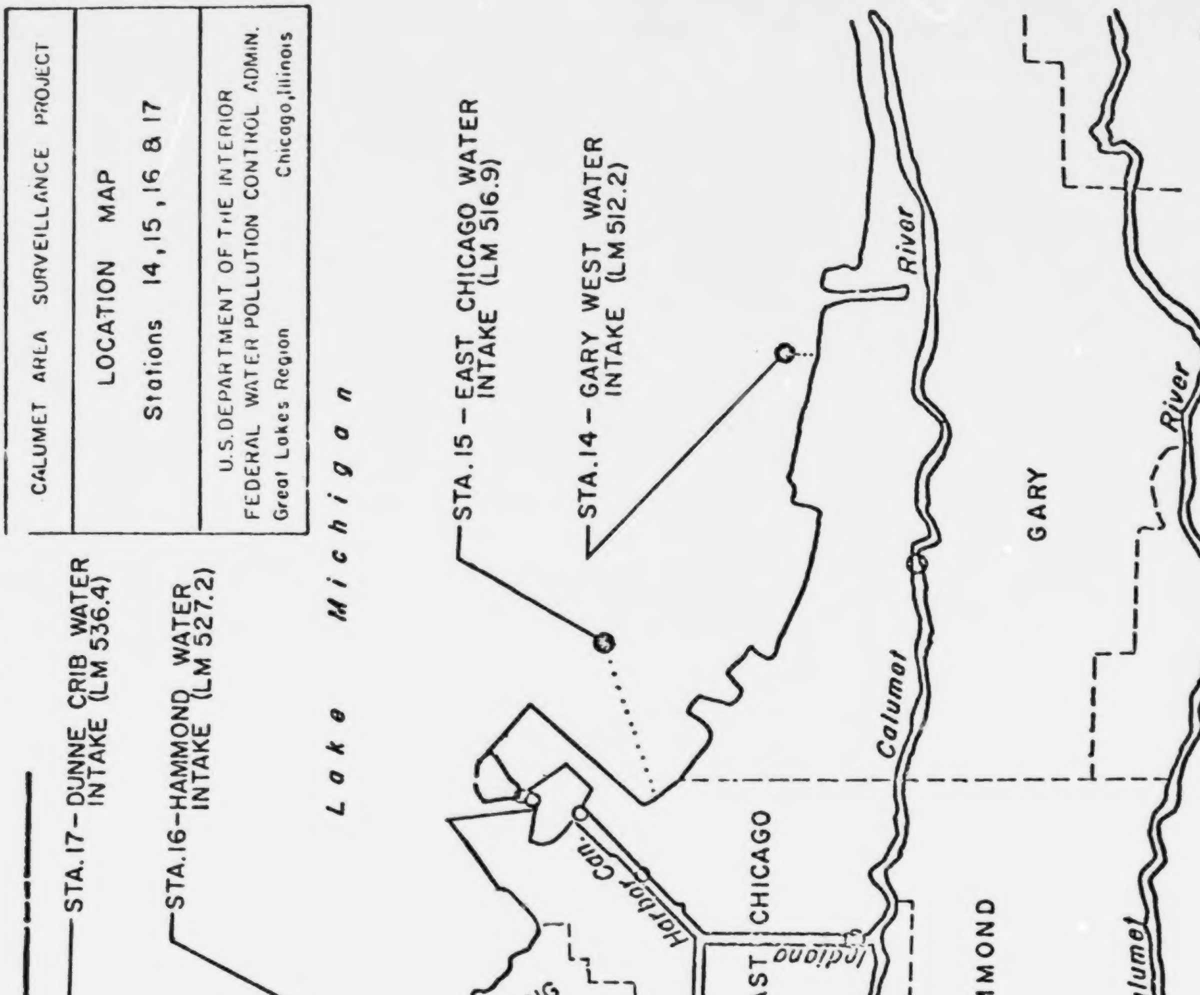


CALUMET AREA SURVEILLANCE PROJECT

BACTERIAL RESULTS
STATION 13

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

FIGURE 13B


CALUMET AREA SURVEILLANCE PROJECT
LOCATION MAP
Stations 14, 15, 16 & 17
U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region
Chicago, Illinois
STA. 17 - DUNNE CRIB WATER INTAKE (LM 536.4)
STA. 16 - HAMMOND WATER INTAKE (LM 527.2)
STA. 15 - EAST CHICAGO WATER INTAKE (LM 516.9)
STA. 14 - GARY WEST WATER INTAKE (LM 512.2)
Lake Michigan
Calumet Harbor
Wolf Lake
WHITING
Harbor Can.
EAST CHICAGO
Indiana
HAMMOND
GARY
CHICAGO
Lake Calumet
Calumet River
Grand Calumet River
Little Calumet River
ILLINOIS
INDIANA

Station 14 - Lake Michigan at Gary West Water Intake

The Gary West water intake is located in Lake Michigan approximately one mile off shore at Gary, Indiana. The intake is remote from sources of wastes and is exposed to the predominant clockwise currents in the southern end of the lake. The water quality should reflect the quality of the open waters of Lake Michigan. This station is a control point for the criteria developed by the Calumet Area Technical Committee and adopted by the State of Indiana (Indiana Regulation SPC 4) for Lake Michigan open water.

Tables 14 and 14A on pages 79 and 80 show that there has been no significant change in water quality since 1966. Figure 14B on page 81 shows that criteria for total coliforms were met on all occasions since 1966 and that the criterion for fecal streptococci has been violated only occasionally. Criteria for temperature, coliform bacteria, turbidity, true color, chlorides, cyanide, fluorides, dissolved iron and sulfates were met on all occasions in 1968 and criteria for fecal streptococci, threshold odor, pH, dissolved oxygen, ammonia nitrogen, MBAS, phenol and dissolved solids were substantially met during 1968.

The only criteria that were seriously violated were the ones regulating total phosphates. These criteria (maximum total phosphates not more than 0.04 mg/l and annual average not more than 0.03 mg/l)were tentatively recommended by the Calumet Area Technical Committee "pending thorough determination of existing concentration in Lower Lake Michigan Conference Area." They were adopted without this reservation by the states of Illinois and Indiana. Figure 14B shows that the median value has been approximately 0.02 mg/l as P or 0.06 mg/l as PO_4 since 1966 and has not changed appreciably.

The following provisions of Indiana Regulation SPC 4 were violated during the first six months of 1968:

Fecal Streptococci Number/100 ml	*Not more than 25*

One value in 14 samples had a fecal streptococci count of 30 per 100 ml. The remaining values were less than 25 per 100 ml.

Threshold Odor units

Daily Average	*Not more than 4*
Single Value	*Not more than 8*

The average threshold odor during the first six months of 1968 was 6 units with a maximum of 8 units.

pH units

Annual median	*Within range 8.1-8.4*
Daily median	*Within range 7.7-9.0*

The median pH for the first six months of 1968 was 8.0 with a maximum of 8.2 and a minimum of 7.8.

Dissolved Oxygen - Percent saturation

Annual Average	*Not less than 90*
Single Value	*Not less than 80*

The average dissolved oxygen for the first six months of 1968 was 102 percent. One of the fifteen values was less than 80 percent.

Ammonia Nitrogen (N) mg/l

Annual Average	*0.02*
Single Daily Value or Average	*0.05*

The average ammonia nitrogen concentration for the first six months of 1968 was 0.02 mg/l. One of the 15 samples had a concentration of over 0.05 mg/l.

Total Nitrogen N mg/l *0.4*

Eight of the fifteen samples had a total nitrogen concentration over 0.4 mg/l with a maximum of 0.63 mg/l.(Total nitrogen is calculated as the sum of ammonia nitrogen,nitrate-nitrite nitrogen and organic nitrogen).

Methylene Blue Active Substance mg/l

Annual Average	*Not more than 0.05*
Single Daily Value or Average	*Not more than 0.20*

The average MBAS concentration for the first six months of 1968 was 0.06 mg/l with a maximum of 0.09 mg/l.

Phenol-like Substances mg/l

Annual Average	*Not more than 0.001*
Single Value	*Not more than 0.003*

The average phenol concentration of phenol during the first six months was less than 0.001 mg/l. One of the thirteen samples had a concentration greater than 0.003 mg/l.

Total Phosphates (PO_4) mg/l

Annual Average	*Not more than 0.03*
Single Daily Value or Average	*Not more than 0.04*

The average phosphorus concentration (as PO_4) for the first six months of 1968 was 0.06 mg/l. 60% of the samples had total phosphorus (as PO_4) concentrations over 0.04 mg/l with a maximum of 0.18 mg/l.

Filterable Residue (Total Dissolved Solids) mg/l

Annual Average	*Not more than 165 (through 1970)*
Single Daily Value or Average	*Not more than 200 (through 1970)*

The average total dissolved solids concentration for the first six months of 1968 was 171 mg/l with a maximum of 197 mg/l.

WATER QUALITY - TABLE 14

STATION 14 - GARY WEST WATER INTAKE

Parameter		Aug-Dec 1966			Jan-June 1967			July-Dec 1967			Jan-June 1968			Criteria*		
		Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
Temp.	°C	22	1	13	18	1	6	25	6	15	17	2	9	29.3		
Tot.Coli.per	100 ml	1300	4	258	1500	2	150	900	90	380	180	5	34	2500		200
Fec. Strep	" " "	30	1	4	400	2	24	6	2	2	30	2	4	25		
Fec. Coli	" " "	130	2	17	1000	2	59	430	5	104	10	5	5			
pH		8.1	7.1	-	8.5	7.4	-	8.2	7.7	-	8.2	7.8	-	9.0	7.7	8.1-8.4 (med)
Diss. Oxygen	% sat.	128	53	87	108	83	96	103	72	86	105	74	102		80%	90%
BOD	mg/1	2.0	0.1	1.4	2.9	0.2	1.6	-	-	-	-	-	-			
COD	"	21	2	10	22	4.4	10.9	17	1.2	5.9	-	-	-			
Chloride	"	11	8	10	26	7	12	10	6	9	10	6	7	15		9
Sulfate	"	37	16	23	33	17	25	25	19	22	28	18	22	50		24
NH_3-N	"	.28	.01	.07	.28	0	.10	.30	.01	.05	.08	.01	.02	.05		.02
NO_2-NO_3-N	"	.54	.05	.24	.50	.14	.30	.62	.11	.20	.43	.15	.23			
Org. Nitrogen	"	.46	.01	.21	.50	.07	.24	.49	.02	.20	.41	.05	.19			
Tot. Phos.	"	.078	.007	.024	.068	.013	.026	.068	.010	.025	0.06	.006	0.02	.013		.010
Sol. Phos.	"	.016	.003	.011	.059	.007	.016	.032	.007	.012	0.03	.009	0.01			
Fluoride	"	.40	.10	.21	.40	.30	.36	.34	.17	.26	.42	.12	.25	1.3		1.0
MBAS	"	.13	.02	.06	.14	.02	.05	.08	.01	.03	.09	.02	.06	.20		.05
Tot. Iron	"	3.9	.05	.63	1.9	.05	.51	2.9	.09	.61	-	-	-			
Phenol	ug/1	5.0	0	1.5	5	0	1.3	15	0	4	4	0	1	3		1
Oil & grease	mg/1	4.8	0	1.0	4.0	0	0.7	3.1	0	1.0	4.1	0.4	2.1			
Cyanide	"	.01	0	0	.01	0	0	0	0	0	0	0	0	0.025		
Color	units	20	0	4.5	7.0	0	2.7	7	0	0	8	0	2	15	5	
Turbidity	"	49	.6	10	36	1.3	12	18	0	1.9	8.1	0.0	2.1			
Susp. Solids	mg/1	149	3	22	83	3	15	53	2	13	29	0	7			
Diss. Solids	"	215	135	171	196	131	174	195	150	166	197	155	171	200		165
Conductivity	umho/cm	325	260	295	335	240	280	280	250	272	300	250	275			
Threshold Odor	units	60	1.5	5.9	25	1.5	6.3	8	0	5	8	0	6	8		4
No. of samples			22			26			17			14				

* Calumet Area Enforcement Conference - Criteria 1

WATER QUALITY - TABLE 14A

MEDIAN VALUES - STATION No. 14

GARY WEST WATER FILTRATION INTAKE

Parameter		1965	Jan-June 1966	Aug-Dec 1966	Jan-June 1967	July-Dec 1967	Jan-June 1968
Water Temp.	°C	NOT SAMPLED IN 1965	NOT SAMPLED IN JAN-JUNE 1966	13	4	17	7
Tot. Coli.	per 100 ml			160	70	200	15
Fec. Strep	" " "			1	2	2	2
Fec. Coli	" " "			9	6	20	5
pH				7.7	7.9	8.0	8.0
Dis. Oxygen	mg/1			9.6	12.8	8.1	11.5
BOD	"			1.3	1.6	-	-
COD	"			10	9.5	4.9	-
Chlorides	"			10	10	8	7
Sulfate	"			21	25	21	24
NH3-N	"			0.06	0.06	0.03	0.01
NO2-NO3-N	"			0.22	0.29	0.2	0.22
Org. Nitrogen	"			0.21	0.25	0.17	0.18
Tot. Phos.	"			0.02	0.02	0.02	0.02
Sol. Phos.	"			0.01	0.01	0.01	0.01
Fluoride	"			0.2	0.38	0.24	0.26
Tot. Iron	"			0.44	0.35	0.3	-
Phenol	ug/1			1.0	1	1	0
Oil & Grease	mg/1			0.5	0	0.9	2.2
Cyanide	"			0.00	0.00	0.00	0.00
Susp. Solids	"			9	11	6	5
Dis. Solids	"			170	173	161	167
MBAS	"			0.05	0.05	0.02	0.04
Conductivity	umho/cm			295	280	275	275
Turbidity	units			2.0	10	0.9	2.0
Color	"			5.0	3.05	0	2
Threshold Odor	"			2.5	5	6	6
No. of samples				22	26	17	14

CALUMET AREA SURVEILLANCE PROJECT

BACTERIAL RESULTS
STATION 14

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

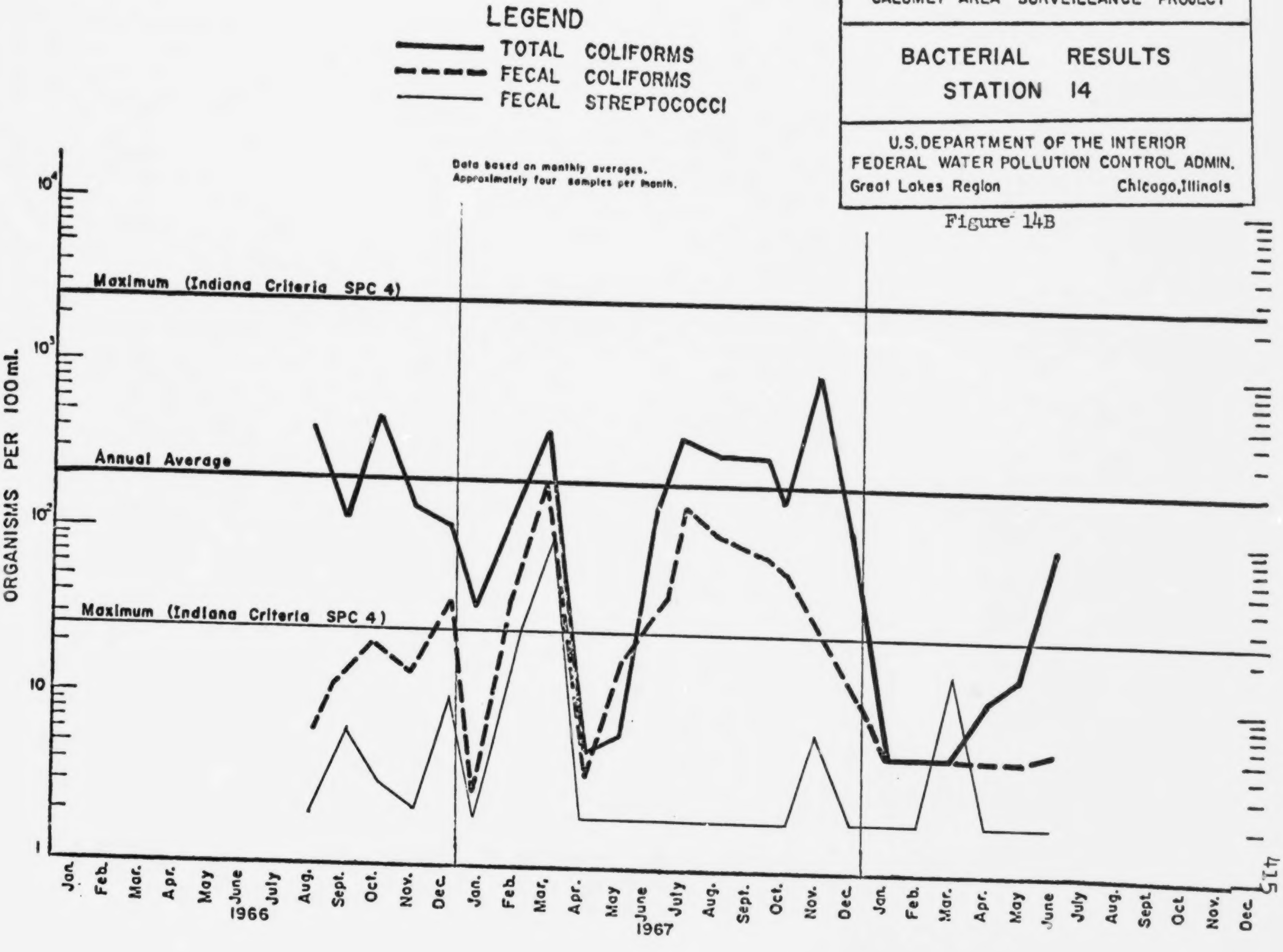


Figure 14B

Station 15 - Lake Michigan at East Chicago Water Intake

The East Chicago Water Intake is located in Lake Michigan just to the east of the peninsula formed by the Inland Steel landfill. It is two miles east of the mouth of Indiana Harbor and is affected by discharges from the harbor during periods of west or northwest winds. This station is one of the two control points established by the Calumet Area Technical Committee for Lake Michigan Inner Harbor Basin waters. The state of Indiana has adopted the criteria developed by the Calumet Area Technical Committee for Inner Harbor Basin waters (Indiana Regulation SPC 6).

The effect of Indiana Harbor on the water quality at this intake can be gaged by comparing Tables 15 and 15A with Tables 14 and 14A. Almost all of the parameters are higher at East Chicago than at Gary. In spite of this the water quality at East Chicago essentially meets all of the criteria except for the criteria on phosphorus. Tables 15 and 15A on pages 83 and 84 show reduced amounts of bacteria, chloride, ammonia, phosphorus, color, turbidity and phenol during Jan-June 1968 than during Jan-June 1967. This is probably due to the reduced amount of runoff which resulted from the cold, dry period of January to March 1968. The reduction in phenol and threshold odor is significant because it reflects the effectiveness of the efforts made by Inland Steel and Youngstown Sheet and Tube Company to reduce this pollutant.

The following provisions of the criteria (Indiana Regulation SPC 6) were violated during the first six months of 1968:

Threshold Odor - units

Annual Average	*Not more than 8*
Single Daily Value or Average	*Not more than 20*

The average threshold odor during the first six months of 1968 was 9 units. One of the 14 samples had a threshold odor greater than 20 units.

Ammonia Nitrogen (N) mg/l

Annual Average	*0.05*
Single Daily Value or Average	*0.12*

One of the 13 samples had 0.21 mg/l ammonia.

Total Phosphates (PO_4) mg/l

Annual Average	*Not more than 0.05*
Single Daily Value or Average	*Not more than 0.10*

During the first six months of 1968 the average total phosphate concentration (as PO_4) was 0.06 mg/l. One of the 14 samples had a concentration greater than 0.10 mg/l.

WATER QUALITY - TABLE 15

STATION 15 - EAST CHICAGO WATER INTAKE

Parameter	Aug-Dec 1966			Jan-June 1967			July-Dec 1967			Jan-June 1968			Criteria*		
	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
Temp. °C	21	0	13	17	0	5	27	8	15	18	1	10	29.3		
Tot.Coli.per 100 ml	8500	5	1060	5000	10	848	3800	15	1600	380	5	70	5000		2000
Fec. Strep " " "	540	2	34	1500	2	167	120	2	24	10	2	3	100		
Fec. Coli " " "	260	2	52	3200	5	439	1800	2	360	160	5	20			
pH	8.1	7.4	-	8.4	7.4	-	8.6	7.8	-	8.5	7.8	-	9.0	7.5	8.0-8.5 (med)
Diss. Oxygen % sat.	128	85	116	124	100	111	126	26	103	116	72	97		65%	80%
BOD mg/1	5.5	0.2	1.6	6.0	0.4	2.0	12	2.3	5.5	-	-	-			
COD "	62	3	13	68	5.1	16	-	-	-	-	-	-			
Chloride "	13	8	10	19	7	12	15	6	10	14	6	8	30		18
Sulfate "	36	16	25	35	18	26	32	18	25	32	18	23	75		36
NH_3-N "	.40	.02	.14	.80	.02	.22	.38	.02	.13	0.21	0.01	0.05	.12		.05
NO_2-NO_3-N "	.60	0	.25	.50	.11	.28	.42	.09	.24	.40	.17	.24			
Org. Nitrogen "	1.19	.05	.29	1.1	.10	.35	.49	.05	.28	.68	.04	.24			
Tot. Phos. "	.326	.010	.039	.297	.010	.039	.070	.010	.035	.05	.003	.02	.032		.016
Sol. Phos. "	.023	.003	.013	.020	.007	.016	.025	.007	.016	.020	.002	.011			
Fluoride "	.28	.14	.20	.50	.26	.36	.48	.16	.27	.36	.10	.24	1.3		1.0
MBAS "	.13	.04	.07	.16	.01	.06	.10	.01	.05	.10	.03	.06	.30		.10
Tot. Iron "	22	.05	1.5	7.8	.05	.82	1.9	.07	.45	-	-	-			
Dis. Iron "	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	.30		.15
Oil & grease "	4.2	0	0.9	4.8	0	1.0	3	0	1	7.8	0	2.6			
Cyanide "	0.2	0	0	.02	0	0	.01	0	0	0.01	0.0	0.0	0.1		
Color units	50	0	8	5	0	3	3	0	1	3	0	1	15		5
Turbidity "	160	.6	15	51	1.8	12	15	0	2	10.1	0	2.2			
Susp. Solids mg/1	464	2	37	378	1	29	48	3	14	22	1	6			
Diss. Solids "	211	147	168	200	161	176	200	149	175	198	157	178	230		190
Conductivity umho/cm	360	275	307	350	245	286	305	245	277	305	250	278			
Threshold Odor units	100	1.5	15	175	1.5	74	15	3	10	30	6	9	20		8
Phenol ug/1	7	0	1.5	16	0	5	8	0	2	2	0	1	5		2
No. of samples		22			26			18			14				

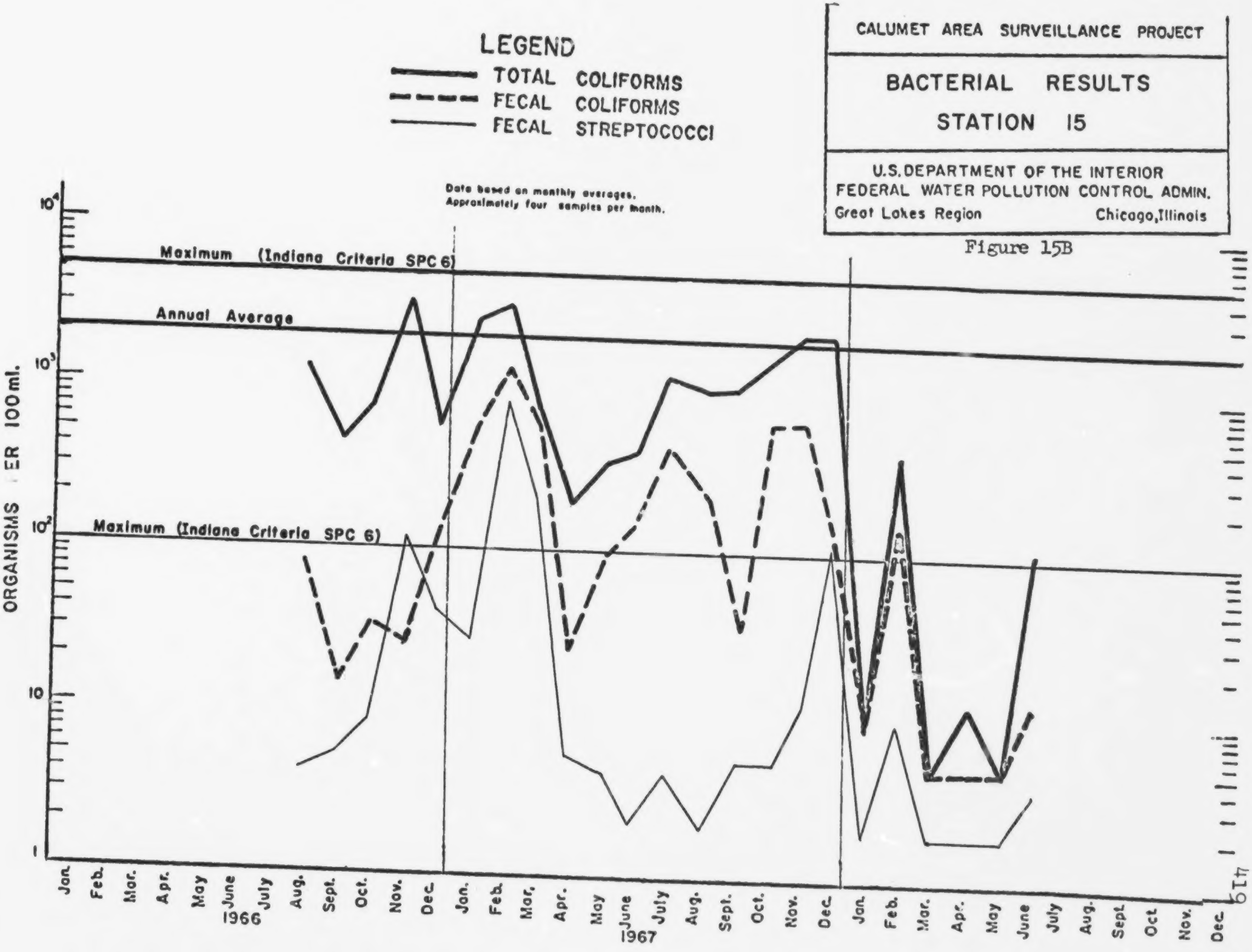
* Calumet Area Enforcement Conference - Criteria 2

WATER QUALITY - TABLE 15A

MEDIAN VALUES - STATION No. 15

EAST CHICAGO WATER FILTRATION INTAKE

Parameter		1965	Jan-June 1966	Aug-Dec 1966	Jan-June 1967	July-Dec 1967	Jan-June 1968
Water Temp.	oC	NOT SAMPLED IN 1965	NOT SAMPLED IN JAN-JUNE 1966	13	3	16	10
Fluorides	mg/1			0.19	0.33	0.28	0.21
Tot. Coli.	per 100 ml			450	470	950	5
Fec. Strep	" " "			4	5	4	2
Fec. Coli	" " "			16	120	150	5
pH				7.7	8.0	8.1	8.2
Dis. Oxygen	mg/1			13	14.7	10.7	11.5
BOD	"			1.6	1.8	-	-
COD	"			11	10	5.0	-
Chlorides	"			10	12	10	7
Sulfate	"			24	26	23	20
NH_3-N	"			0.14	15	0.07	0.05
NO_2-NO_3-N	"			0.27	0.27	0.22	0.23
Org. Nitrogen	"			0.21	0.30	0.23	0.21
Tot. Phos.	"			0.02	0.03	0.023	0.02
Sol. Phos.	"			0.01	0.02	0.02	0.009
Dis. Iron	"			-	-	-	0.0
Tot. Iron	"			0.35	0.37	0.23	0.05
Phenol	ug/1			1	4	1	1
Oil & Grease	mg/1			0.5	0.5	1.0	2.3
Cyanide	"			0.0	0.0	0.0	0.0
Susp. Solids	"			12	14	6	5
Dis. Solids	"			165	175	172	170
MBAS	"			0.06	0.06	0.05	0.05
Conductivity	umho/cm			300	280	280	275
Turbidity	units			2.0	10	1.0	2.0
Color	"			5.0	3	0	1
Threshold Odor	"			5	9	8	8
No. of samples				22	26	18	14



CALUMET AREA SURVEILLANCE PROJECT

BACTERIAL RESULTS
STATION 15

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

Figure 15B

Station 16 - Lake Michigan at the Hammond Water Intake

The Hammond Water Intake is located in Lake Michigan approximately 3/4 mile off shore. It is three miles west of the mouth of Indiana Harbor and 2½ miles southeast of the mouth of the Calumet River.

This station was designated by the Calumet Area Technical Committee as one of the control points for Lake Michigan Inner Harbor waters. The criteria developed by the Technical Committee were adopted by the State of Indiana (Indiana Regulation SPC 6). It is affected by industrial wastes from Indiana Harbor, wastes from combined sewer overflows which discharge to Lake Michigan from Hammond and Whiting, and wastes discharged to Calumet Harbor.

The water quality at this point is the lowest of all four Lake Michigan sampling points. The effect of the combined sewer discharges to the Lake can be assessed by comparing bacterial counts for this station with the other stations. During 1968 the average coliform counts were twelve times higher at Hammond than at East Chicago which is the second most polluted water intake. Higher ammonia, MBAS and occasional oxygen depletions also reflect the presence of sanitary wastes at the intake. The prevailing currents carry a great deal more pollution from Indiana Harbor to Hammond than to the other intakes. This is evident from the higher dissolved iron, cyanide and, before 1968, phenol counts found at the Hammond water intake.

The effects of Inland Steel and Youngstown Sheet and Tube Company's phenol control program are evident at the Hammond water intake. Table 16 shows that the Jan-June 1967 mean was five times greater than the 1968 mean for a reduction of 80%. Phenol concentrations at Hammond met the criteria for the first time in 1968.

Samples from the Hammond water intake were composited on a monthly basis and analyzed for heavy metals. The following table gives the average value for the period October 1967 through June 1968:

	Oct'67-June'68
Copper	0.01 mg/l
Chromium (total)	0.01 mg/l
Potassium	1.5 mg/l
Manganese	0.02 mg/l
Lead	0.02 mg/l
Nickel	0.01 mg/l
Zinc	0.03 mg/l
Sodium	5.1 mg/l
Arsenic	31 ug/l

The following provisions of the criteria (Indiana Regulation SPC 6) were violated during the first six months of 1968:

Fecal Streptococci Number/100 ml *Not more than 100*

Two of the fourteen samples had a fecal streptococci count greater than 100 per 100 ml with a maximum of 500 per 100 ml.

Threshold Odor - units

Annual Average	*Not more than 8*
Single Daily Value or Average	*Not more than 20*

The average threshold odor during the first six months of 1968 was 36 units. 87% of the samples had a threshold odor more than 20 units with a maximum of 70 units.

pH - units

Annual median	*Within range 8.0-8.5*
Daily median	*Within range 7.5-9.0*

The median for the first six months of 1968 was 7.9 with a maximum of 8.3 and a minimum of 7.6.

Dissolved Oxygen - per cent saturation

Annual Average	*Not less than 80*
Single Daily Value or Average	*Not less than 65*

The average dissolved oxygen for the first six months of 1968 was 91% saturation. One of the 15 samples had a dissolved oxygen of 48% of saturation.

Ammonia Nitrogen (N) mg/l

Annual Average	*0.05*
Single Daily Value or Average	*0.12*

The average ammonia concentration for the first six months of 1968 was 0.09 mg/l. 20% of the samples had an ammonia concentration higher than 0.12 mg/l with a maximum of 0.20 mg/l.

Methylene Blue Active Substance mg/l

Annual Average	*Not more than 0.10*
Single Daily Value or Average	*Not more than 0.30*

The average MBAS concentration for the first six months of 1968 was 0.15 mg/l. 13% of the samples had MBAS concentrations over 0.30 mg/l with a maximum of 0.75 mg/l.

Total Phosphates (PO_4)	*mg/l*
Annual Average	*Not more than 0.05*
Single Daily Value or Average	*Not more than 0.10*

The average phosphorus concentration (as PO_4) for the first six months of 1968 was 0.09 mg/l. 37% of the samples had phosphorus concentrations (as PO_4) greater than 0.10 mg/l with a maximum of 0.23 mg/l.

WATER QUALITY - TABLE 16

STATION 16 - HAMMOND WATER INTAKE

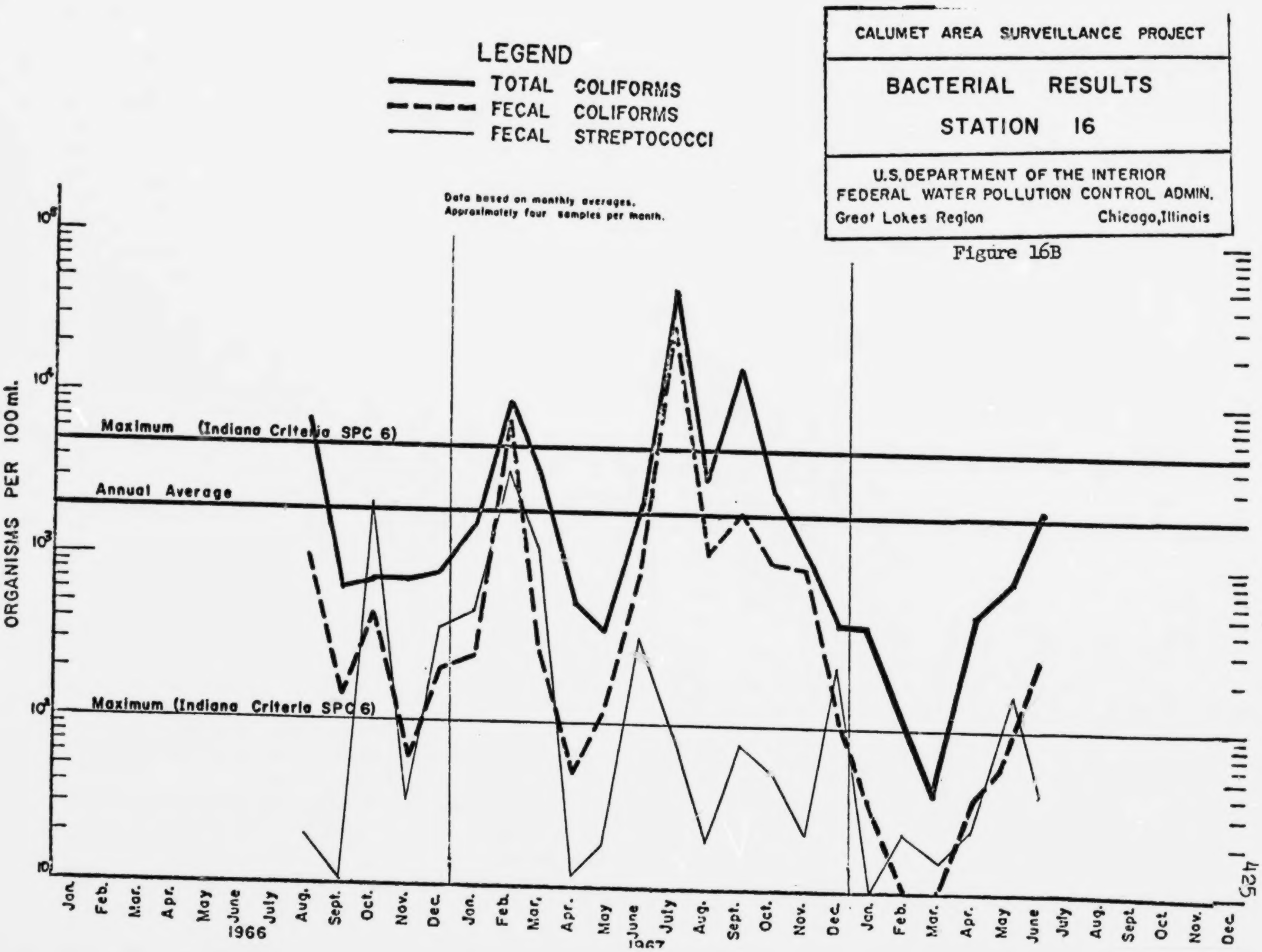
Parameter	Aug-Dec 1966			Jan-June 1967			July-Dec 1967			Jan-June 1968			Criteria*		
	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
Temp. °C	22	0	13	17	0	6	27	5	15	18	1	10	29.3		
Tot.Coli.per 100 ml	19M	110	2050	20M	60	2470	170M	10	12,600	4500	15	1000	5000		2000
Fec. Strep " " "	7600	2	440	5000	2	672	340	2	86	500	5	60	100		
Fec. Coli " " "	1400	8	363	20M	5	1107	98M	10	5250	850	5	108			
pH	7.9	7.2	-	8.1	7.4	-	8.1	7.7	-	8.3	7.6	-	9.0	7.5	8.0-8.5 (med)
Diss. Oxygen % sat.	131	63	87	112	81	92	98	61	83	109	48	91		65%	80%
BOD mg/1	3.6	0.9	1.7	5.5	0.9	2.0	-	-	-	-	-	-			
COD "	32	4	13	22	2	13	11.0	1.8	6.2	-	-	-			
Chlorides "	13	9	10	20	8	12	13	6	10	12	7	8.4	30		18
Sulfate "	38	13	25	33	19	26	55	19	25	28	19	25	75		36
NH3-N "	.38	.04	.18	.36	.03	.17	.15	.02	.08	0.2	0.02	0.09	.12		.05
NO2-NO3-N "	.76	.05	.32	.56	.16	.30	.42	.10	.19	0.37	0.14	0.23			
Org. Nitrogen "	.73	.06	.29	.69	.05	.37	.41	.06	.25	.59	.02	.28			
Tot. Phos. "	.104	.010	.032	.078	.013	.033	.063	.016	.037	.07	.004	.03	.032		.016
Sol. Phos. "	.020	.003	.013	.023	.010	.016	.023	.007	.015	0.03	0.01	0.02			
Fluorides "	.24	.16	.20	.46	.28	.33	.34	.13	.26	.29	.14	.22	1.3		1.0
MBAS "	.12	.03	.07	.20	.02	.07	.08	.01	.03	.75	.02	.15	.30		.10
Tot. Iron "	5.9	.04	.85	2.7	.10	.72	1.90	.09	.79	-	-	-			
Dis. Iron "	-	-	-	-	-	-	-	-	-	0.09	0.00	0.02	.30		.15
Oil & grease "	5.4	0	.8	3.9	0	1.1	3.7	0	1.0	5.4	0.3	2.4			
Cyanide "	.01	0	0	.02	0	0	0	0	0	.04	0	.01	0.1		
Color units	15	0	5	10	0	5	8	0	1	10	0	2	15		5
Turbidity "	180	0.6	17	38	1.8	14	11	0	1.5	10.0	0	2.8			
Susp. Solids mg/1	202	2	31	71	2	19	40	2	14	41	1	13			
Diss. Solids "	275	154	174	195	151	173	217	151	170	195	149	175	230		190
Conductivity umho/cm	320	275	303	345	245	290	315	250	278	300	230	282			
Threshold Odor units	150	3.5	34	800	4	74	80	20	33	70	20	36	20		8
Phenol ug/1	6	0	2	29	0	5	24	0	5	3	0	1	5		2
No. of samples		22			26			18			15				

* Calumet Area Enforcement Conference - Criteria 2

WATER QUALITY - TABLE 16A

MEDIAN VALUES - STATION No. 16
HAMMOND WATER FILTRATION INTAKE

Parameter		1965	Jan-June 1966	Aug-Dec 1966	Jan-June 1967	July-Dec 1967	Jan-June 1968
Water Temp. °C		NOT SAMPLED IN 1965	NOT SAMPLED IN JAN-JUNE 1966	13	3	18	11
Fluoride	mg/l			0.20	0.32	0.24	0.17
Tot. Coli.	per 100 ml			800	600	1500	600
Fec. Strep	" " "			14	30	25	10
Fec. Coli	" " "			60	85	900	20
pH				7.7	7.9	7.9	7.9
Dis. Oxygen	mg/l			9.3	11.4	8.6	10.5
BOD	"			1.6	2.0	-	-
COD	"			12	13	5.7	-
Chlorides	"			10	11	9	8
Sulfate	"			25	26	23	27
NH_3-N	"			0.16	0.17	0.06	0.08
NO_2-NO_3-N	"			0.26	0.3	0.2	0.21
Org. Nitrogen	"			0.26	0.33	0.25	0.29
Tot. Phos.	"			0.02	0.03	0.04	0.03
Sol. Phos.	"			0.01	0.01	0.01	0.02
Dis. Iron	"			-	-	-	0.0
Tot. Iron	"			0.52	0.58	0.38	-
Phenol	ug/l			2	2	1	1
Oil & Grease	mg/l			0.4	0.8	1.1	2.5
Cyanide	"			0.00	0.0	0.0	0.0
Susp. Solids	"			13	12	7	7
Dis. Solids	"			170	174	169	174
MBAS	"			0.07	0.06	0.03	0.06
Conductivity	umho/cm			300	295	275	285
Turbidity	units			2.8	9	0.4	1.7
Color	"			4	4	0	2
Threshold Odor	"			16	30	30	30
No. of samples				22	26	18	15



CALUMET AREA SURVEILLANCE PROJECT

BACTERIAL RESULTS
STATION 16

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

Figure 16B

Station 17 - Lake Michigan at Chicago's Dunne Crib Water Intake

Dunne crib is a water intake in Lake Michigan which serves the city of Chicago's south district filtration plant. It is located 3½ miles north of Calumet Harbor about 2 miles off shore. This station is one of the two control points established by the Calumet Area Technical Committee for Lake Michigan open waters. The state of Illinois has adopted the criteria developed by the technical committee for open Lake Michigan waters (Illinois Rules and Regulations SWB 7 - Rule 1.01).

The water quality at this point is best of the four water intakes sampled although it does not meet many of the criteria established for open Lake Michigan water. Tables 17 and 17A on pages 94 and 95 show ammonia nitrogen and turbidity have decreased since 1966. None of the other parameters have changed significantly.

The following provisions of the criteria (Illinois Rules and Regulations SWB 7 - Rule 1.01) were violated at Dunne Crib water intake during 1968:

Threshold Odor units

Daily Average	*Not more than 4*
Single Value	*Not more than 8*

The average threshold odor during the first six months of 1968 was 9 units. 13% of the samples had threshold odors above 8 units with a maximum of 47 units.

Dissolved Oxygen percent saturation

Annual Average	*Not less than 90*
Single Value	*Not less than 80*

The average dissolved oxygen during the first six months of 1968 was 111%. One sample had a dissolved oxygen below 80%.

Ammonia Nitrogen (N) mg/l

Annual Average	*0.02*
Single Daily Value or Average	*0.05*

The average ammonia nitrogen concentration during the first six months of 1968 was 0.03 mg/l. 13% of the samples had ammonia nitrogen concentrations above 0.05 mg/l with a maximum of 0.18 mg/l.

Total Nitrogen (N) mg/l *0.40*

62% of the samples had a total nitrogen concentration greater than 0.40 mg/l with a maximum of 1.12 mg/l.

Total Phosphates (PO_4) mg/l

Annual Average	*Not more than 0.03*
Single Daily Value or Average	*Not more than 0.04*

The average total phosphorus concentration (as PO_4) during the first six months of 1968 was 0.05 mg/l. 75% of the samples had a phosphorus concentration (as PO_4) greater than 0.04 with a maximum of 0.11 mg/l.

These violations occurred during periods of stormy weather with the exception of the violations of the criteria on Total Nitrogen and Total Phosphorus.

WATER QUALITY - TABLE 17

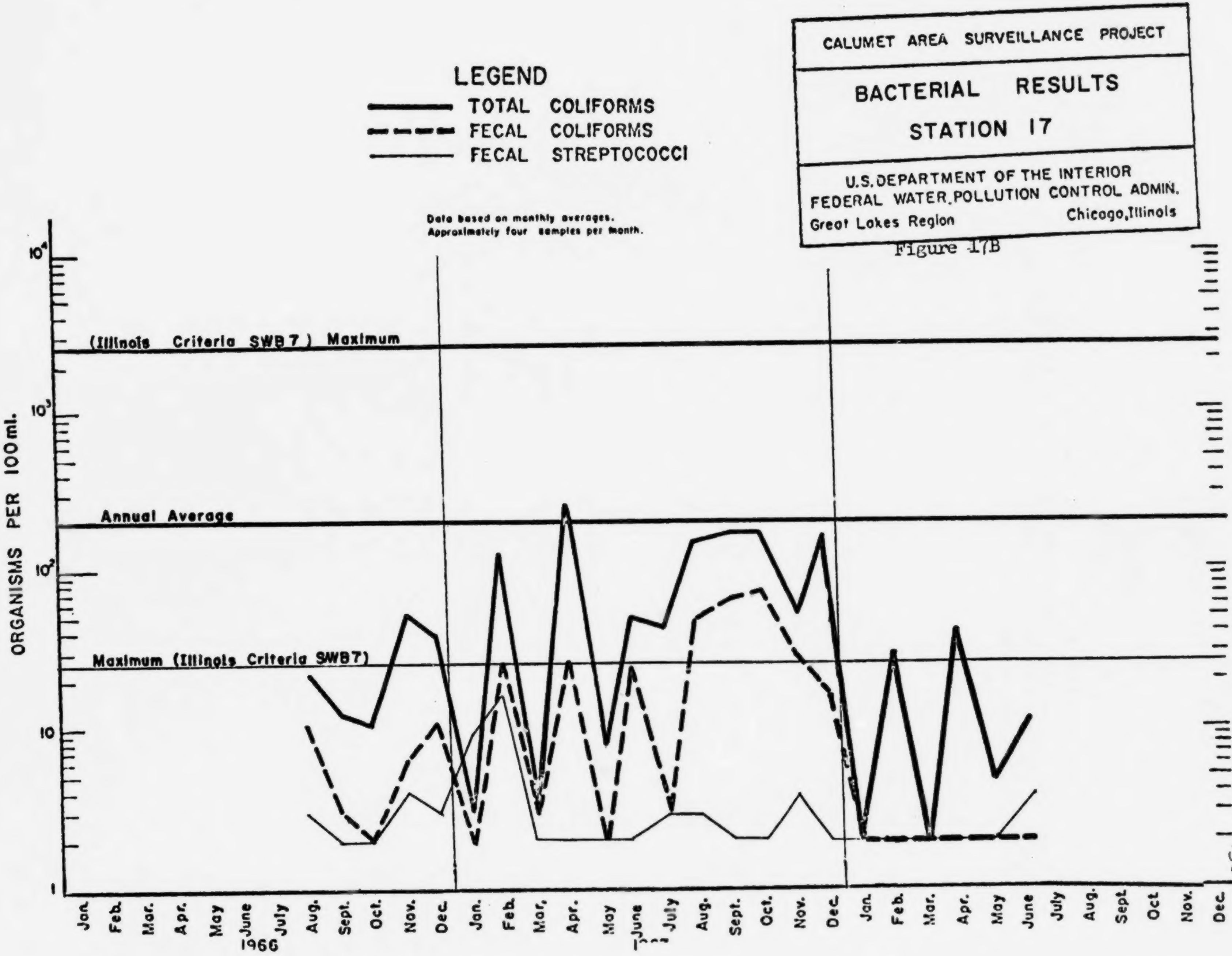
STATION 17 - DUNNE CRIB WATER INTAKE

Parameter		Aug-Dec 1966			Jan-June 1967			July-Dec 1967			Jan-June 1968			Criteria*		
		Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
Temp.	°C	23	3	15	18	4	9	25	7	15	18	3	11	29.3		
Tot.Coli.per 100 ml		135	2	27	900	2	69	470	4	120	120	2	17	2500		200
Fec. Strep " " "		10	1	3	40	2	5	6	2	3	12	2	3	25		
Fec. Coli " " "		20	2	6	98	2	13	200	2	36	5	2	2			
pH		8.1	7.6	-	8.5	7.2	-	8.6	7.6	-	8.6	8.2	-	9.0	7.7	8.1-8.4 (med)
Diss. Oxygen	% sat.	136	69	114	119	93	107	159	82	117	148	77	111		80%	90%
BOD	mg/l	1.6	0.2	0.9	3.0	0.5	1.4	-	-	-	-	-	-			
COD	"	18	2	10	18	4	10	9.1	2.3	5.1	-	-	-			
Chlorides	"	12	8	9	17	8	11	11	6	8	11	5	7	15		9
Sulfate	"	32	13	22	30	19	24	24	17	22	27	16	22	50		24
NH_3-N	"	.23	.01	.07	.33	.01	.08	.10	.01	.02	.18	.01	.03	.05		.02
NO_2-NO_3-N	"	.67	.05	.22	.92	.14	.27	.33	.06	.16	.46	.03	.23			
Org. Nitrogen	"	.33	.02	.19	.70	.06	.29	.74	.07	.23	.74	.08	.26			
Tot. Phos.	"	.068	.006	.020	.052	.006	.023	.042	.007	.020	.035	.003	.017	.013		.010
Sol. Phos.	"	.020	.003	.010	.023	.006	.016	.020	.007	.011	.024	.003	.011			
Fluorides	"	.30	.16	.20	.50	.26	.38	.32	.19	.25	.36	.14	.24	1.3		1.0
MBAS	"	.12	.02	.05	.10	.01	.05	.06	0	.02	.08	.01	.04	.20		.05
Tot. Iron	"	3.9	.01	.47	1.4	.04	.36	.55	.04	.20	-	-	-			
Phenol	ug/l	3	0	0.6	9	0	2	3	0	1	3	0	1	3		1
Oil & grease	mg/l	6.7	0	0.9	2.7	0	0.9	3.8	0.3	1.1	5.4	0.5	2.4			
Cyanide	"	.01	0	0	.01	0	0	0	0	0	.01	.00	.00	0.025		
Color	units	10	0	4	7	0	3	5	0	1	9	0	1.4	15		5
Turbidity	"	160	0.6	13	44	0.8	11	2.0	0	0.8	9.0	0.0	0.22			
Susp. Solids	mg/l	135	1	17	58	1	17	35	1	10	21	1	6			
Diss. Solids	"	196	145	162	205	159	172	203	144	167	196	151	172	200		165
Conductivity	umho/cm	330	260	292	350	250	285	285	250	269	290	226	272			
Threshold Odor	units	35	2.5	6	50	1.5	7	30	3	4	47	3	9	8		4
No. of samples			22			26			16			15				

* Calumet Area Enforcement Conference - Criteria 1

WATER QUALITY - TABLE 17A
MEDIAN VALUES - STATION No.17
SOUTH DISTRICT DUNNE CRIB WATER FILTRATION INTAKE

Parameter		1965	Jan-June 1966	Aug-Dec 1966	Jan-June 1967	July-Dec 1967	Jan-June 1968
Water Temp.	°C	NOT SAMPLED IN 1965	NOT SAMPLED IN JAN-JUNE 1966	15	10	17	12
Tot. Coli.	per 100 ml			15	2	80	2
Fec. Strep	" " "			1	2	2	2
Fec. Coli	" " "			1	27	15	2
pH				7.8	8.2	8.3	8.4
Dis. Oxygen	mg/1			13.2	11.7	12.3	12.3
BOD	"			1.0	1.4	-	-
COD	"			8	8	5.5	-
Chlorides	"			9	9	8	7
Sulfate	"			23	24	22	22
NH_3-N	"			0.05	0.05	0.01	0.01
NO_2-NO_3-N	"			0.2	.24	0.15	0.22
Org. Nitrogen	"			0.2	0.26	0.19	0.21
Tot. Phos.	"			0.02	0.02	0.02	.014
Sol. Phos.	"			0.01	0.01	0.01	.011
Fluoride	"			0.2	0.40	0.24	0.26
Tot. Iron	"			0.19	0.25	0.07	-
Phenol	ug/1			0	1	0	1
Oil & Grease	mg/1			0.7	0.8	1.0	2.7
Cyanide	"			0.00	0.0	0.00	0.00
Susp. Solids	"			7	6	6	4
Dis. Solids	"			160	170.	164	169
MBAS	"			0.05	0.04	0.02	0.04
Conductivity	umho/cm			290	280	270	275
Turbidity	units			2.7	5.5	0.7	0.08
Color	"			3	3	0	1
Threshold Odor	"			6	4	3	4
No. of samples				22	26	16	15



CALUMET AREA SURVEILLANCE PROJECT

BACTERIAL RESULTS

STATION 17

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

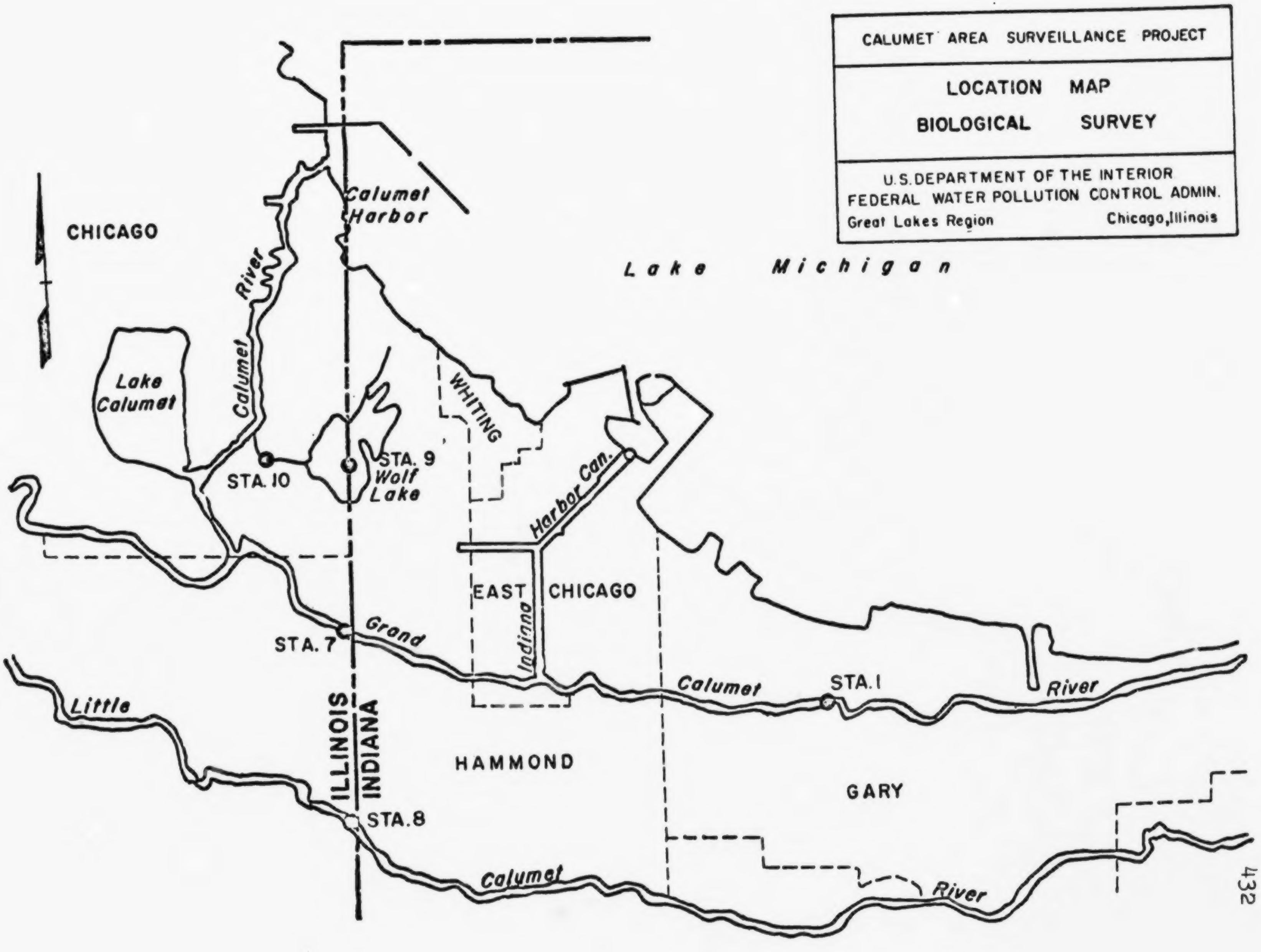
Figure 17B

TABLE 18

PRECIPITATION

The relationship between precipitation and water quality is referred to throughout this report. The following table gives the total monthly precipitation in inches at the Gary sewage treatment plant, which is located on the Grand Calumet River near Station 1.

Month	Total Precip.
Jan. 1965	4.28
Feb.	1.81
Mar.	2.52
Apr.	3.61
May	3.78
June	1.17
July	1.77
Aug.	6.55
Sep.	6.47
Oct.	2.41
Nov.	1.72
Dec.	6.12
Jan. 1966	0.66
Feb.	1.44
Mar.	1.62
Apr.	5.94
May	4.97
June	2.18
July	3.62
Aug.	2.96
Sep.	1.26
Oct. 1966	2.50
Nov.	4.81
Dec.	3.33
Jan. 1967	1.74
Feb.	1.11
Mar.	2.49
Apr.	4.46
May	1.45
June	4.91
July	2.24
Aug.	3.09
Sep.	3.76
Oct.	5.96
Nov.	2.42
Dec.	3.71
Jan. 1968	1.67
Feb.	1.68
Mar.	2.96
Apr.	2.63
May	2.73
June	6.10



CALUMET AREA SURVEILLANCE PROJECT

LOCATION MAP

BIOLOGICAL SURVEY

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

BIOLOGICAL SAMPLING PROGRAM

For the purpose of the biological sampling program five stations were selected from the seventeen regular sampling stations utilized by the Calumet Area Surveillance Project. The five selected represent a wide variety of water quality conditions.

Station 1 (Grand Calumet River-east) represents a stream highly polluted by industrial wastes.
Station 7 (Grand Calumet River-west) represents a stream highly polluted by industrial and municipal wastes.
Station 8 (Little Calumet River) represents a stream heavily polluted by combined sewer overflows.
Station 9 (Wolf Lake) represents a relatively pollution-free lake.
Station 10 (Wolf Lake Outlet) represents a relatively pollution-free stream.

Benthic samples were collected at these stations during April 1967 and April 1968. Table 19 on page 100 shows the results of these two surveys. These results confirm the conclusion drawn from the results of the chemical analyses.

The presence of large numbers of pollution-tolerant sludgeworms at the Grand Calumet River at the Pennsylvania Railroad bridge shows that the river is still heavily polluted by sanitary as well as industrial wastes. The effect of combined sewer overflows is evident at the Wentworth Avenue bridge over the Little Calumet River where direct industrial pollution is not significant. Large populations of sludgeworms were the only organisms found at this point.

The lower population of sludgeworms found in the Grand Calumet River at the Indiana Harbor Belt Railroad bridge is a result of higher concentrations of toxic materials found in the river at this point. No other species were found during 1968.

Wolf Lake shows a typical balanced population found in clean water environments. The total number of organisms is low because the organic food supply is not excessive and many species,both pollution-tolerant and pollution-intolerant are represented.

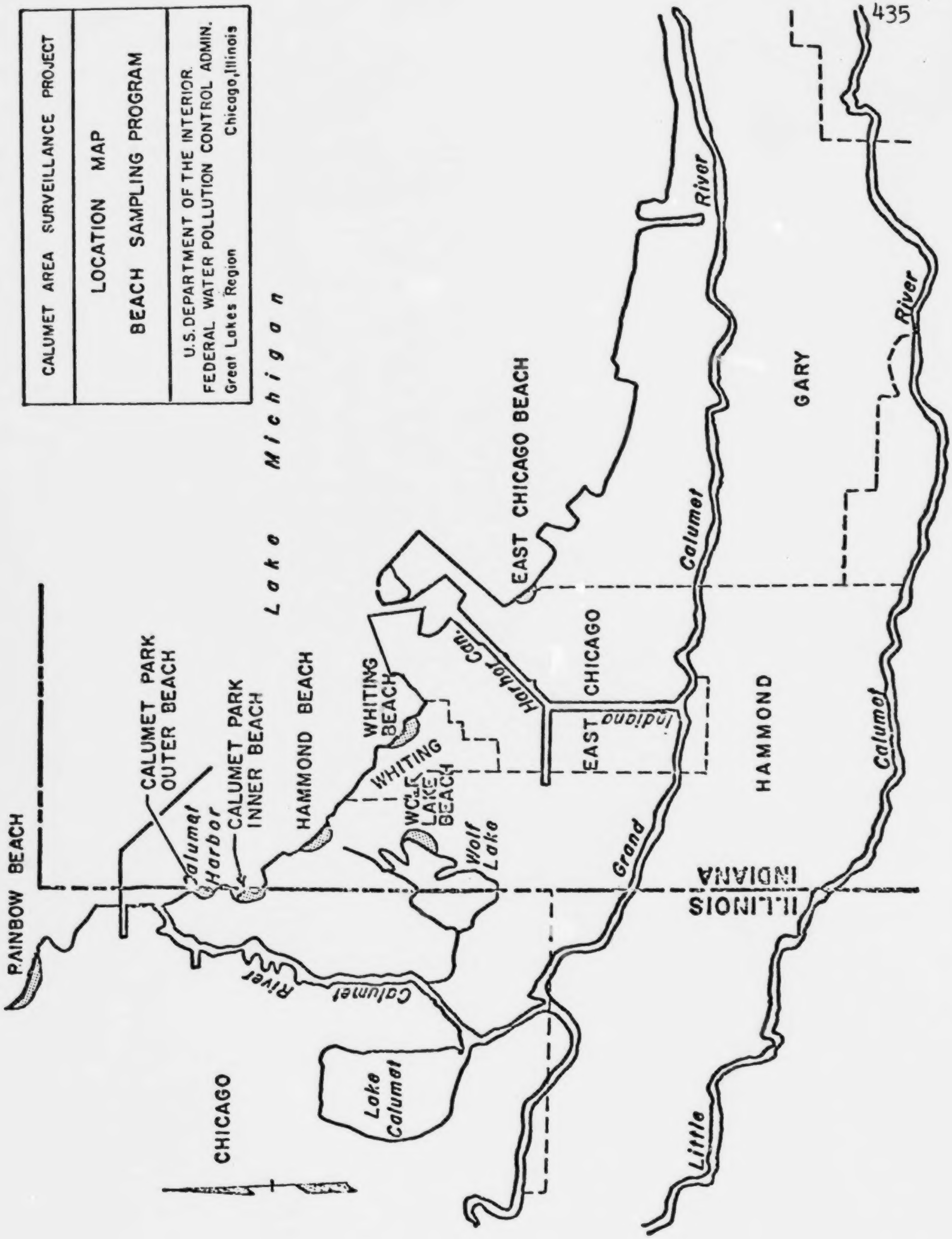
The Wolf Lake channel at Carondolet Avenue shows some signs of deterioration because it passes through marshy areas but there is no evidence of severe pollution and some pollution-intolerant species were found.

TABLE 19

BENTHIC POPULATIONS FOUND AT SELECTED CALUMET AREA STATIONS
April 1967 and April 1968

	April 1967		April 1968	
Station	Species	Organisms per square meter	Species	Organisms per square meter
1. Grand Calumet River at Pennsylvania RR bridge	Sludgeworms	18,790	Sludgeworms	[illegible],800
7. Grand Calumet River at Indiana Harbor Belt RR bridge	Sludgeworms	2190	Sludgeworms	2280
	Flowerfly larva	90		
	Tricoptera larva	40		
8. Little Calumet River at Wentworth Avenue	Sludgeworms	11,790	Sludgeworms	60,080
9. Wolf Lake at Indiana-Illinois state line	Data not available		Sludgeworms	210
			Bloodworms	90
			Leeches	40
			Lung-breathing snails	40
			Aquatic sowbugs	40
			Scuds	300
			Mayfly larvae	40
10. Wolf Lake Channel at Carondolet Ave	Sludgeworms	100	Sludgeworms	2410
	Midge	10	Bloodworms	390
	Leeches	10	Leeches	130

435


CALUMET AREA SURVEILLANCE PROJECT

LOCATION MAP

BEACH SAMPLING PROGRAM

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

Beach Sampling Program

Six Lake Michigan beaches in the Calumet Area were sampled for bacterial quality twice each week during the 1967 and 1968 bathing seasons. This program was conducted from May 18 to September 15 in 1967, and from May 16 to September 12 in 1968. The beaches sampled were Rainbow Beach, Calumet Park Inner Beach, Calumet Park Outer Beach, Hammond Beach, Whiting Beach and East Chicago Beach. Both Rainbow and Calumet Park Inner beaches were sampled at two points. The Hammond Beach on Wolf Lake was also sampled. The location of each beach is shown on the location map, page 101.

Samples were obtained in four feet of water at elbow depth by samplers who waded into the lake wearing rubber waders. The purpose of the rubber waders was to prevent contamination of the sample by the sampler. The samples were immediately stored on ice and are processed by the laboratory within a few hours of collection. Samplers recorded the following information at the time of collecting the sample: number of bathers within 100 feet, air temperature, water temperature, wind speed and direction, height of waves, cloud and weather conditions and any other factors that may have affected water quality.

Samples collected by the Surveillance Project were processed in the Chicago Program Office by means of the membrane filter (MF) method to determine total coliform, fecal coliform and fecal streptococci.

The laboratory methods followed are in accordance with the procedures established in "Standard Methods for the Examination of Water and Wastewater" (12th ed). Fecal coliform determinations are made by the MF method, using M-FC broth base (Difco) with Rosolic acid as an indicator. This method was developed by [1]Geldreich, et al., at the Robert A. Taft Sanitary Engineering Center in Cincinnati, Ohio.

The criteria for determining satisfactory water quality for bathing at the Calumet Area beaches are the following:

a. The water quality is satisfactory if MF coliforms are less than 1000 and MF fecal streptococci are less than 100 per 100 milliliter (ml) of sample.

b. The water quality is satisfactory if MF coliforms are between 1000 and 5000 and MF fecal streptococci are less than 20 per 100 ml of sample.

An average of the five most recent counts is used to determine if the water quality is satisfactory.

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[1] Geldreich, E. E., et al., JAWWA 57 (2) 208 (1965).

1967 Results

During the 1967 bathing season, all the Chicago beaches sampled showed considerable improvement in bacterial water quality over the preceding season. This is seen in Figures B1, B2 and B3 which graphically depict the maximum, mean and median values for total coliform, fecal streptococci, and fecal coliform, respectively, observed during the study period. Although all the beaches still failed to meet criterion limits on a number of occasions, the frequency of such failures was reduced by up to 45%. Table B1 shows that Calumet Park Outer Beach improved most notably to a point where the water quality was similar to that at Rainbow Beach. Calumet Park Inner Beach at 100th Street showed the least improvement, being polluted roughly 40% of the time.

Figure B4 illustrates the total coliform counts observed throughout the summer at the Chicago beaches studied. A period of gross bacterial contamination occurred from July 6 to July 12. The massive alewife die-off that occurred prior and during the period left the beaches covered with dead and decomposing fish. The alewives provided a rich environment in which bacteria could multiply rapidly, and therefore are the most probable cause for the high bacterial counts during July. Another factor is that the winds on sampling days were predominantly easterly during late June and the first half of July. These winds not only brought in more alewives, but prevented polluted water near the shore from being dispersed into the lake.

The three Lake Michigan beaches in Indiana (Hammond, Whiting and East Chicago) failed to meet the criteria during 1967 more than 75% of the time. Table B1 and Figures B1, B2 and B3 show a slight improvement in water quality at Hammond and Whiting but that East Chicago beach was polluted more often during 1967 than during 1966. The sources of pollution on these beaches are Indiana Harbor and combined sewer overflows from Hammond, Whiting and East Chicago.

The Hammond beach on Wolf Lake met the criteria on all occasions during 1967.

1968 Results

During the summer of 1968 the bacterial water quality of the Chicago beaches studied (Rainbow, Calumet Park Outer and Calumet Park Inner) deteriorated from the condition found in 1967. Violation of the criteria was more frequent in 1968 except at the Calumet Park, Inner beach at 100th St., which showed some improvement (Table B1).

Average total coliform counts for the five Chicago beaches are shown in Figure B4. It is evident that massive bacterial contamination occurred on or near June 25 and to a lesser extent on July 18, 25 and August 1. A large rainstorm occurred on June 25. Northeast winds prevailed at that time and apparently trapped on the beaches much of the bacterial pollution flushed by the stormwater. Holleyman[2] has shown that during periods of precipitation there is a strong correlation between winds with an easterly component and

[2] "A Study of Relationship of Coliform Count in Calumet-Indiana Harbor Area to Wind Direction and Precipitation"
Presented at the Eleventh Conference on Great Lakes Research, Milwaukee, Wisconsin, April 18-20, 1968.

high coliform counts on the beaches. Between July 18 and August 1 the prevailing winds were shoreward during the days that high counts were observed. However, little precipitation was evident during this time.

On August 17, heavy rainfall occurred throughout the area. To avoid flooding, the locks on the Chicago River were opened, allowing water which was grossly polluted by combined sewers to flow into Lake Michigan. Apparently, the west and southwesterly winds that followed the storm swept much of the pollution out into the lake since noticeably high coliform counts were not evident at the South Chicago beaches by the 19th, only two days after the storm.

The Lake Michigan beaches at Hammond and Whiting showed some improvement in the 1968 season. However, conditions must still be considered critical, since violations of the criteria occurred more than 64% of the time. The beach at East Chicago showed much more improvement in water quality than either Hammond or Whiting. The frequency of criteria violation dropped 50% in 1968. As with the Chicago beaches, violations were more frequent when easterly winds were prevalent.

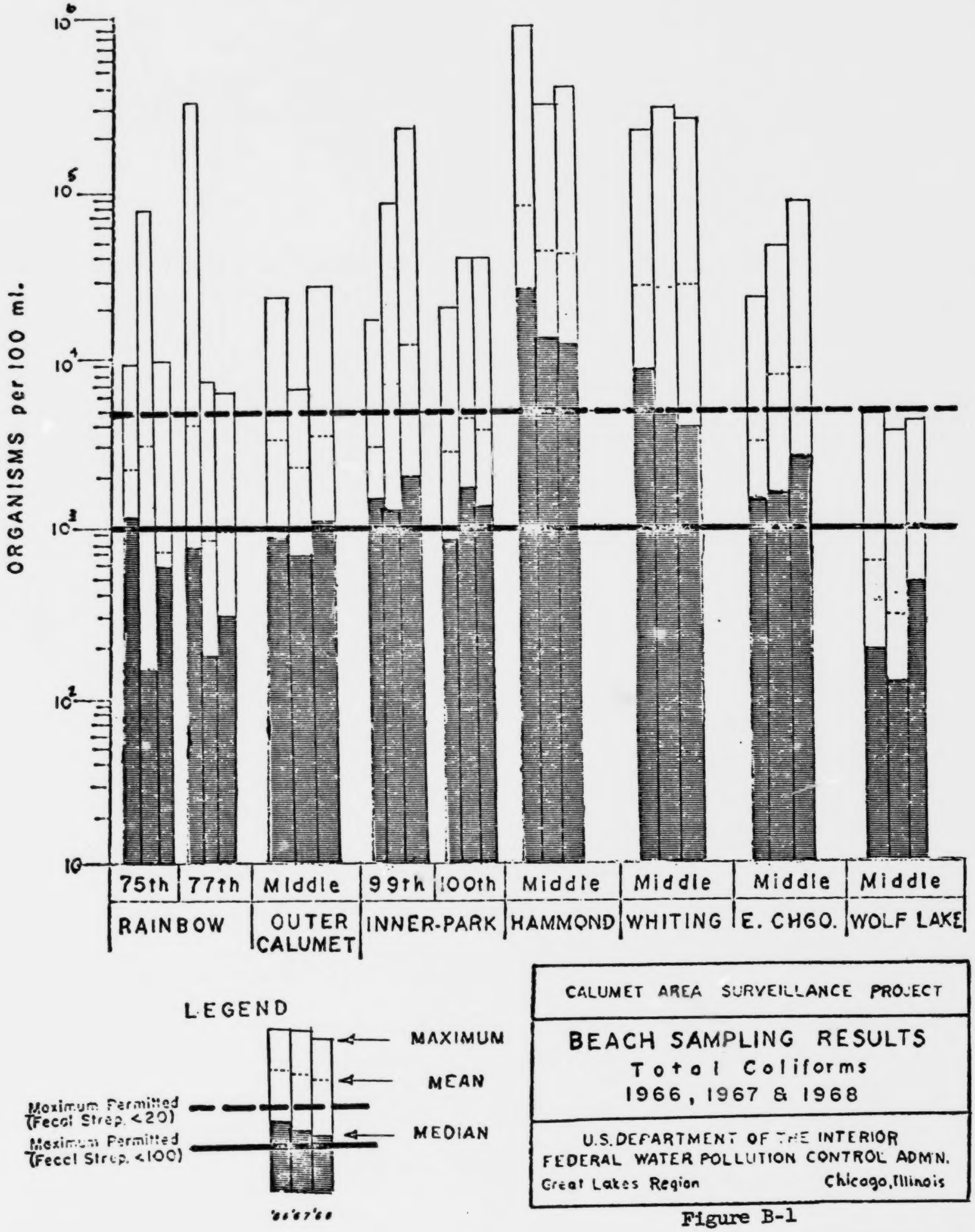
The Hammond beach on Wolf Lake showed violations of the criteria for the first time during the study period. Over 20% of the samples failed to meet the criteria, whereas during previous years no failures were found.

The data indicates that the heavy use of a beach by bathers increases the coliform counts somewhat but not enough to cause extensive violations of the criteria. During 1967 Rainbow beach and the beaches in Calumet Park were not used extensively for bathing because of the alewife problem. Figure B-4 shows that the bacterial counts during 1967 were somewhat lower than during 1968 when these beaches were used heavily. This difference did not occur on the Hammond or Whiting beaches where bathing is very light or at the water intakes where there is no bathing. It is concluded therefore that bathing caused the increase in those samples not affected by heavy rainfall.

TABLE B-1

FREQUENCY OF CRITERIA VIOLATIONS AT CALUMET AREA BEACHES

BEACH	1966 No. of samples	1966 No. of failures	1966 % of failures	1967 No. of samples	1967 No.of failures	1967 % of failures	1968 No. of samples	1968 No. of failures	1968 % of failures
Rainbow - 75th St.	31	11	36	33	4	12	34	11	32
Rainbow - 77th St.	31	13	42	32	5	16	34	9	27
Calumet Park-Outer	31	19	61	32	5	16	34	9	27
Calumet Park-Inner - 99th St.	32	20	62	33	11	33	34	17	50
Calumet Park-Inner-100th St.	31	18	58	33	13	40	34	8	24
Hammond	32	31	97	33	30	91	34	22	65
Whiting	31	29	94	33	26	79	33	21	64
East Chicago	32	18	56	33	25	76	33	12	36
Wolf Lake - 121st St.	32	0	0	32	0	0	33	7	21

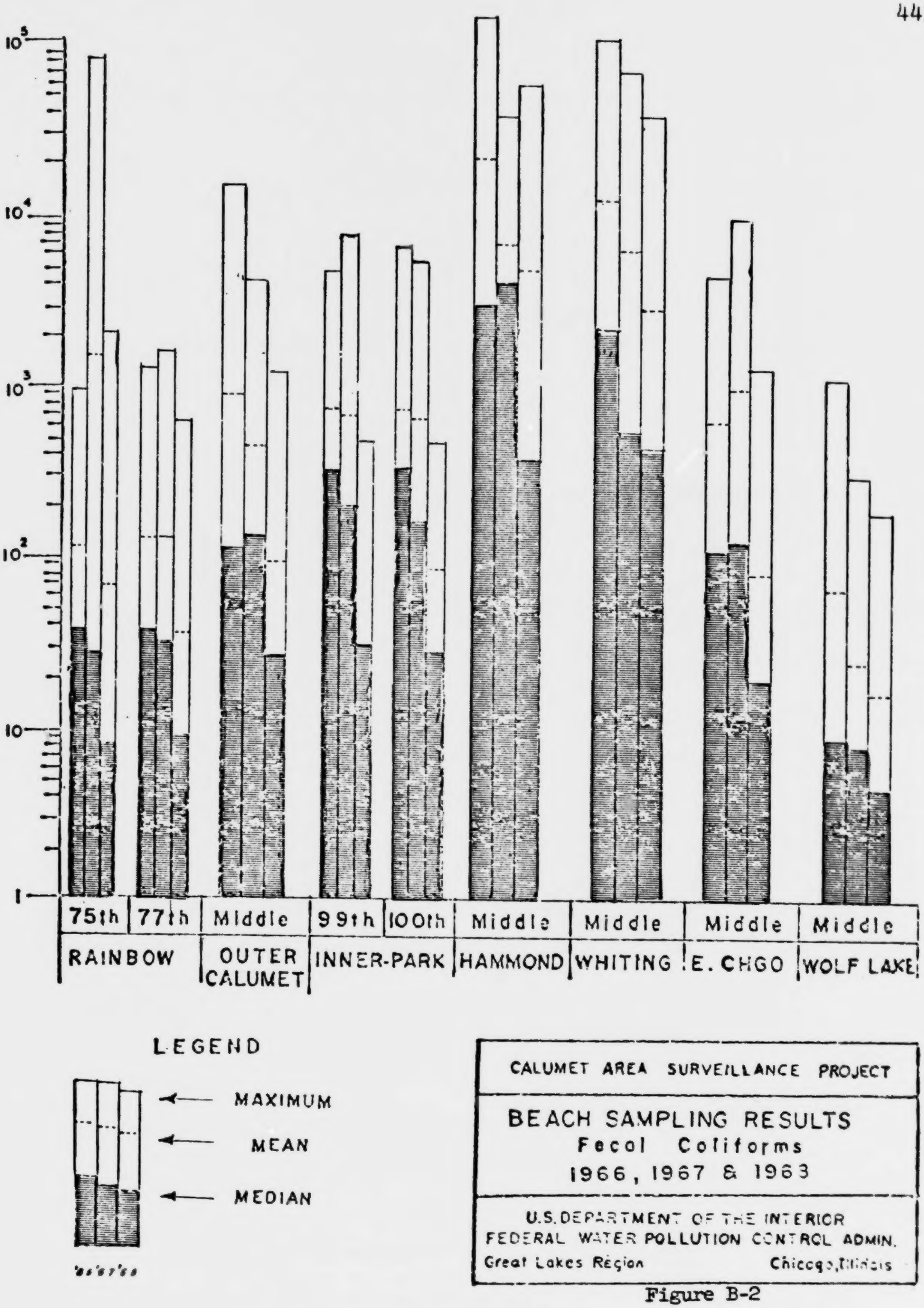


CALUMET AREA SURVEILLANCE PROJECT

BEACH SAMPLING RESULTS
Total Coliforms
1966, 1967 & 1968

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADM'N.
Great Lakes Region Chicago, Illinois

Figure B-1

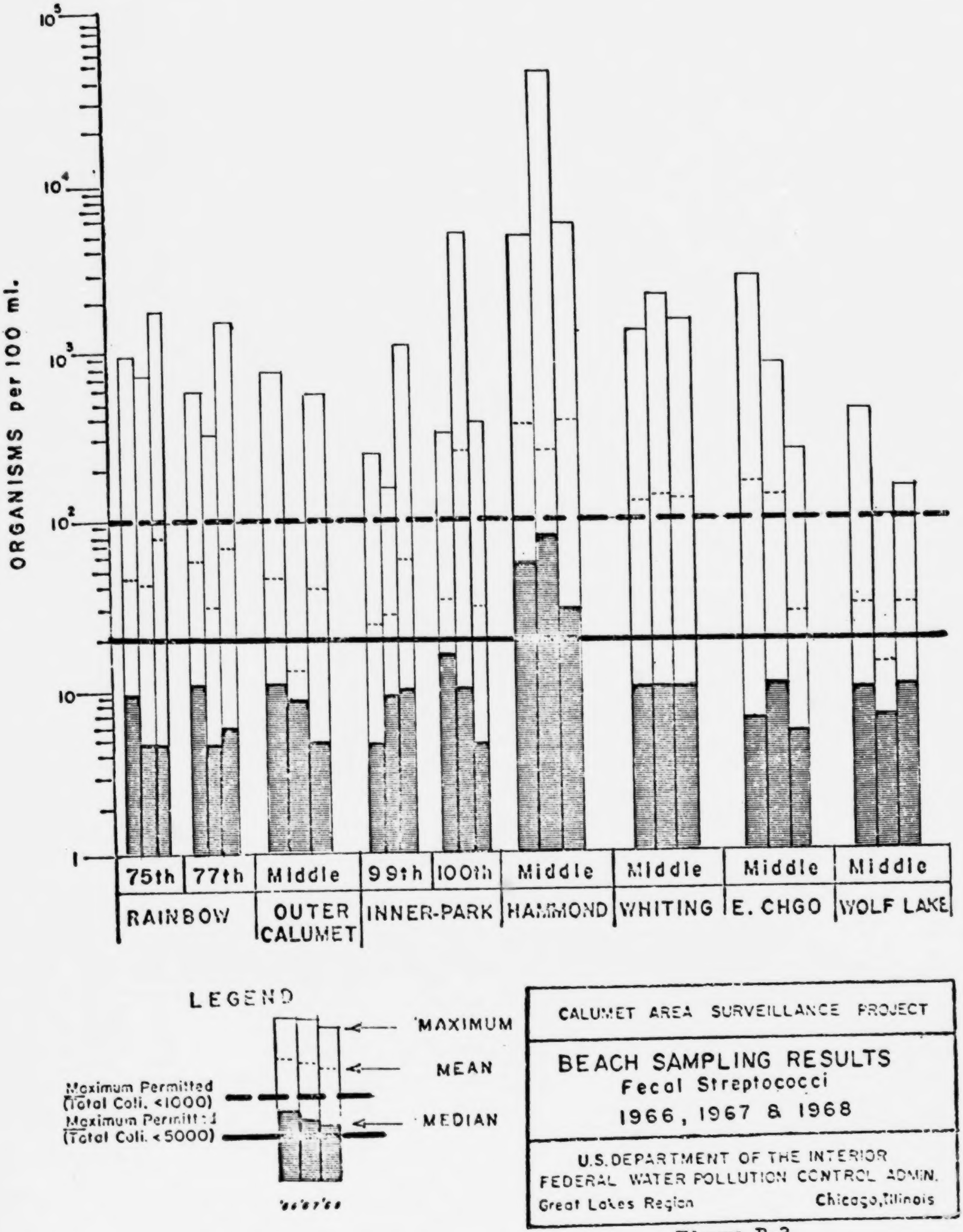


CALUMET AREA SURVEILLANCE PROJECT

BEACH SAMPLING RESULTS
Fecal Coliforms
1966, 1967 & 1968

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

Figure B-2

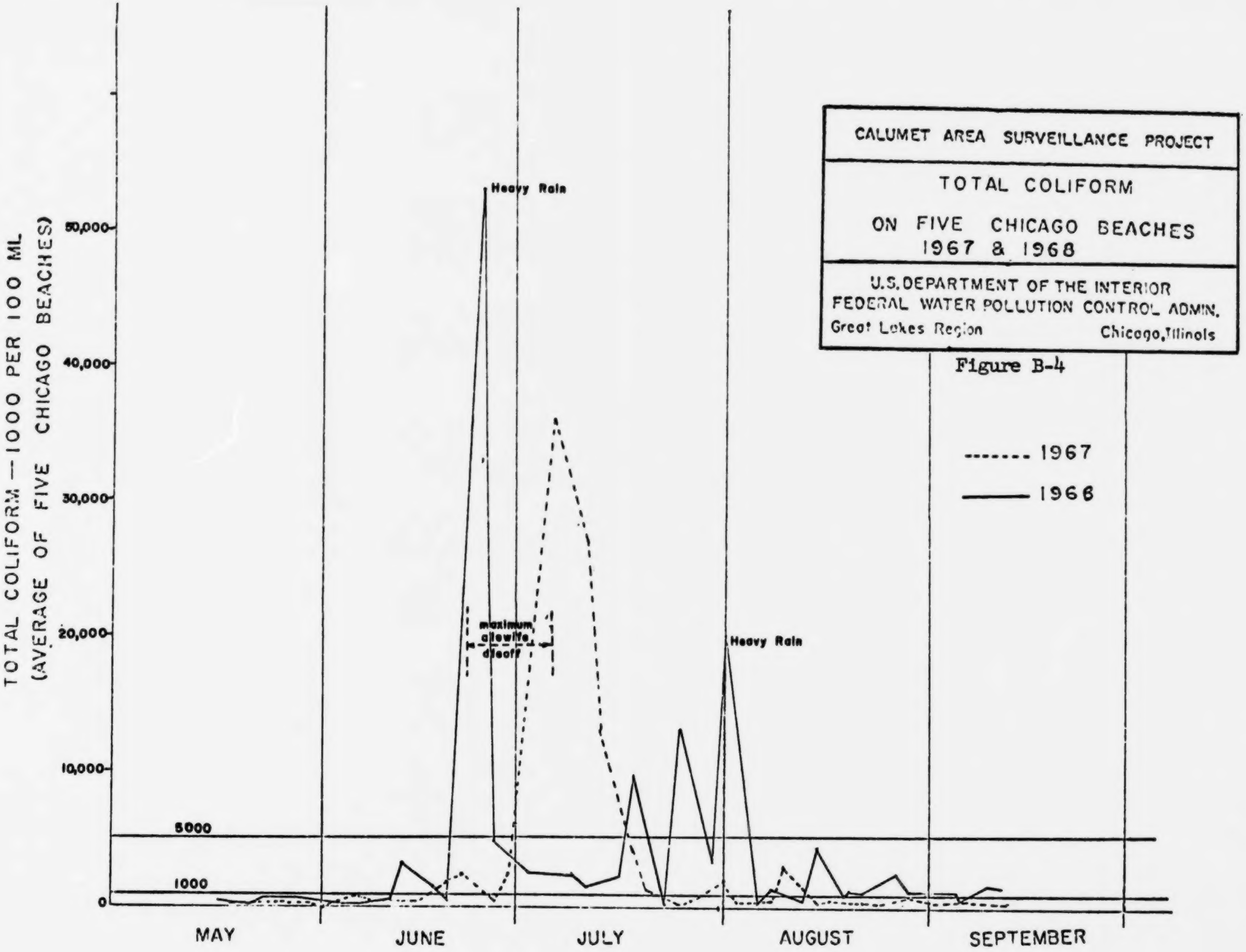


CALUMET AREA SURVEILLANCE PROJECT

BEACH SAMPLING RESULTS
Fecal Streptococci
1966, 1967 & 1968

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

Figure B-3



CALUMET AREA SURVEILLANCE PROJECT

TOTAL COLIFORM
ON FIVE CHICAGO BEACHES
1967 & 1968

U.S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMIN.
Great Lakes Region Chicago, Illinois

Figure B-4

R. J. Bowden

MR. BOWDEN: This report is based on the results of a stream sampling program that has been conducted in the area since July 1965. The sampling points are located at Pennsylvania Railroad Bridge over the Grand Calumet River, which is just below the U. S. Steel complex in Gary but is above most of the other sources of pollution, so that this sampling point represents the river below the steel complex.

The next point is on the Indiana Harbor Canal at 151st Street, which is just below the point where the two branches of the Grand Calumet River merge to form the Indiana Harbor Canal, and as a result this point is representative of the waters entering the canal and it is also affected by the Hammond and East Chicago sewage treatment plants.

The third point on the Indiana Harbor Canal is at the Dickey Road Bridge, and this point seems to be the most critical point for pollution on the canal. The dissolved oxygen at this point seems to be the lowest.

The fourth point is at the mouth of the canal.

The fifth point is at the Coast Guard station which is located at Indiana Harbor, and this is the control point for the State of Indiana's criteria that they established for the Indiana Harbor Canal.

The next point is on the Grand Calumet River on the State line, which, of course, is the control point set by the Technical Committee.

Another point is on the Little Calumet River at Wentworth Avenue, which is near the State line, and this is also a control point established by the committee.

There is a point on Wolf Lake which is on a culvert which is located right directly on the State line, and this point was set by the control committee, by the Technical Committee, to protect the quality of both lakes.

Another point is on the outlet from Wolf Lake to the Calumet River.

Another point is at the mouth of the Calumet River which monitors the water quality at that point.

Another one is in Calumet Harbor itself.

The remaining four points are water intakes located in Lake Michigan, and these four points have been adopted by the Technical Committee as control points for

Lake Michigan water. The committee broke Lake Michigan water into two categories--one the open waters of the lake which are represented by the water intake at Gary and also by the South Water Filtration Plant which Mr. Vaughn spoke extensively on. The remaining water is the inner harbor basins, and this is represented by the East Chicago water intake and by the Hammond water intake.

One of the needs recognized by the Conferees in 1965 was improved and uniform laboratory techniques for analyzing water samples. They directed, therefore, that a committee be established which would consist of the laboratory directors of the various laboratories that are involved in water pollution work in the area. This committee was charged with determining the reliability of the analytical procedures as normally used in the desired concentration range, determining if there is a change in the accuracy of these procedures arising from departures from prescribed analytical routine, determining the degree of variation between the participating laboratories, determining the sensitivity of the methods used and recommending necessary changes in procedures. Thus far, this committee has improved the analysis for ammonia nitrogen, adopted a new method of analyzing for phosphorus which greatly reduces interferences caused by industrial wastes and has greatly improved the sampling techniques for phenolic compounds. At present, the committee is studying the analysis for cyanide.

Now, I would like to present the conclusions of the detailed report presented to the Conferees.

CONCLUSIONS

1. Industrial pollution in the Grand Calumet-Indiana Harbor Canal system has not been greatly reduced since 1965. Concentrations of iron, cyanide and oil and grease have not been reduced since 1965.

2. Fecal pollution in the Grand Calumet River-Indiana Harbor Canal system has been reduced only in the upstream reach above the Gary Sewage Treatment Plant. Bacterial counts at downstream sampling points have not decreased.

3. Water quality in the western portion of the Grand Calumet River at the State line has deteriorated further since 1965. Concentrations of BOD, COD, ammonia, organic nitrogen, phosphorus, iron, phenol, cyanide, suspended solids and turbidity have all increased since 1965.

4. Water quality in the Little Calumet River does

not meet the criteria although there has been some improvement since 1965. The stream is subject to severe pollution from combined sewer overflows.

5. The water quality in Calumet Harbor met all of the criteria for Lake Michigan Inner Harbor Basins except for the criterion on ammonia nitrogen.

6. The water quality at the mouth of the Calumet River did not meet the Lake Michigan Inner Harbor Basin criteria for turbidity, visible oil, dissolved oxygen, ammonia nitrogen, phenol and phosphorus.

7. No regular sampling was done on the Calumet River but special studies indicate that the river is severely polluted between the mouth and the O'Brien Locks.

8. The general lack of improvement in water quality in the streams of the area since 1965 is primarily attributable to overflows from combined sewers. These combined sewers now carry additional sanitary and industrial wastes which have been diverted to them by industry since 1965. Overflows from combined sewers associated with heavy rainfalls during April and May of 1967 and June of 1968 caused significant increases in bacterial counts at all of the sampling stations.

9. Wolf Lake is a high quality body of water suitable for all water uses, but is threatened by high nutrient concentrations. Except for nutrients there was substnatial compliance with the criteria. The average phosphorus concentration at the State line was 0.09 mg/l during 1968, compared to 0.04 mg/l during 1965. Bacterial concentration at the Wolf Lake-Hammond beach violated bathing criteria for the first time during 1968.

10. The water quality at the East Chicago water intake is affected by wastes from Indiana Harbor which causes violations of the criteria for ammonia, total phosphorus and threshold odor.

11. The water quality at the Hammond water intake is affected by wastes from Indiana Harbor and direct discharges to Lake Michigan which cause violations of the criteria for total coliforms, fecal streptococci, ammonia, total phosphorus and threshold odors.

12. The water quality at Chicago's Dunne Crib and the Gary water intake did not meet the criteria for ammonia, total phosphorus and threshold odor.

13. Phenol concentrations at the East Chicago and Hammond water intakes met the criteria for the first time during the winter of 1968.

14. The water quality at Rainbow Beach and the Calumet Park beaches failed to meet the criteria approximately 66 percent of the time during 1966, 20 percent of the time during 1967 and 33 percent of the time during 1968. High bacterial counts during June and August of 1968 were associated with easterly winds and heavy precipitation.

15. The water quality at Hammond Beach and Whiting Beach failed to meet the criteria 95 percent of the time during 1966, 85 percent of the time during 1967 and 65 percent of the time during 1968.

16. The water quality at the East Chicago Beach failed to meet the criteria 56 percent of the time during 1966, 76 percent of the time during 1967 and 36 percent of the time during 1968.

MR. STEIN: Thank you, Mr. Bowden.

Are there any comments or questions?

MR. KLASSEN: I have one question, Mr. Bowden. I would appreciate any explanation you might have; this interests me.

Your conclusions 5 and 6 where the water quality at Calumet Harbor met all the criteria except for ammonia, yet the number 6, the water quality at the mouth of the Calumet did not meet the same criteria for turbidity, visible oil, dissolved oxygen.

I am wondering, do you have an opinion how there could be such a difference between these two? It would just seem that one would affect the other.

MR. BOWDEN: Well, the primary reason that there is a difference between the two is the proximity of U. S. Steel South Works which discharges to the Calumet Harbor area.

MR. KLASSEN: Wouldn't that--

MR. BOWDEN: And the difference between these two points is the measure of the effect that U. S. Steel has on the area at that point.

MR. KLASSEN: In other words, the material from the Calumet River mouth does not get out into the Calumet Harbor?

MR. BOWDEN: I can't say that all the time.

MR. KLASSEN: Well, this is what this says. This is why I am trying to get an explanation of this.

MR. BOWDEN: This says that there is more pollution at the mouth of the river than there is out in the middle of the harbor, but it does not necessarily say that the water in the river does not get out on occasion to the harbor itself.

MR. KLASSEN: Well, if it does, your analysis doesn't show it.

MR. BOWDEN: The analysis shows that the water quality in the harbor is higher than the water quality at the mouth of the river, which is to be expected.

MR. KLASSEN: I see. I just wondered if you had an explanation of that. I don't and this is why I wanted it.

MR. STEIN: Are there any other comments or questions?

Yes.

MR. POSTON: Mr. Bowden, I think your general conclusion here, then, is that the water quality is not appreciably improved since 1965, is that correct?

MR. BOWDEN: That is the general conclusion, yes, sir.

MR. KLASSEN: Well, I might agree with this--

MR. BOWDEN: There are exceptions.

MR. KLASSEN: --but when you say the general water quality, what are we talking about here? The

Technical Committee purposely set up various areas. Is this an overall analysis of the whole lake, the harbors, or just what?

MR. BOWDEN: Mr. Poston asked me for an overall analysis, and if I had to make an overall analysis I would agree that--

MR. KLASSEN: Things are getting worse?

MR. BOWDEN: Not necessarily that things are getting worse overall, but that there has not been a major improvement overall. When you are talking about individual sites, there are variations, of course.

MR. STEIN: Phenols are getting better, aren't they?

MR. BOWDEN: Yes, the phenol counts at the East Chicago and Hammond water intake did meet the criteria for the first time during the winter of 1968.

MR. STEIN: Yes. It seems to me--let me raise this question if this is significant--as I read the trends in the lake, the water was getting worse all the time. For three years this has not gotten any worse, but about the same. Would this be a reflection of the program we have been having or not?

MR. BOWDEN: Yes, I think that the reduction of phenols is a reflection of the programs by Inland Steel and others.

MR. STEIN: Yes. Again I would like to keep this in perspective. I am not sure if when we get these interim reports, during this construction period when we have indicated that all the works would not be on line yet, whether very much more could have been expected and that as they started going on line we would begin holding our own and the improvement would show up after all the works were in. I don't know if that is the pattern to be expected or that we should have expected better water quality by now. This is really a key question. I don't know if anyone wants to address himself to it, but I think this is what we have to look for.

MR. BOWDEN: I think there are several reasons why the water quality hasn't shown a dramatic improvement since 1965 in spite of the efforts that have been made by the industries. The first one, of course, is the fact that major industries have not completed their efforts yet, and this is illustrated by the request of the steel industries to have more time to complete their major projects, by the fact that the State of Indiana feels that the oil refineries have more work to do to reduce BOD and threshold odor problems, and also another factor involved is that the steel companies have all constructed major operation facilities since 1965 and they have constructed treatment facilities for these new facilities. And actually the percentages that you came up with yesterday are a little bit misleading in that these percentages are based on the waste load in 1968 and not on the waste load in 1965.

I would like to illustrate my point by an example. If you start out with five units of pollution and you are treating one of them, you are treating twenty percent of the pollution. And if you then add five more units of pollution and treat all of those five more units of pollution, you are then treating six of ten units of pollution, which is 60 percent. But as far as the stream is concerned, it is still getting that four units of pollution and as a result wouldn't show any improvement.

MR. STEIN: Let me try to put this another way and see if you can agree with this statement.

What you are saying is: 1) that the plants have not gone all on line yet -- the steel plants; 2) the oil plants need or the indications are that the State of

Indiana, at least, wants them to consider removing additional taste-and-odor-producing substances; 3)--this is the one you made now--that in addition to that, the plants have increased production and even though they have adequate waste treatment with the new production, the increased production load has tended to keep these levels up. Is that correct?

MR. BOWDEN: I would say this is part of the problem.

MR. KLASSEN: I will accept an engineer's explanation instead of a lawyer's, Mr. Stein.

(Laughter.)

MR. STEIN: I know. If we were all engineers we wouldn't have a problem, just a polluted lake.

(Laughter.)

MR. BOWDEN: I believe, Mr. Stein, there is another factor that has also tended to reduce the progress that we might see, and this is the existence of combined sewers, such as Chicago and Hammond, and the State has reported many industries are diverting wastes to these combined sewers. There was an engineering report prepared by a prominent engineering firm in

Indiana dated May of 1966 which made a statement referring to the East Chicago combined sewers and it was to the effect that these sewers overflowed during periods of very light rain and also during periods where there was just the heavy sanitary flow, and since then there have been additional loads to these sewers, so you can imagine what happens when there is a heavy rain now, the overflows must be quite extensive.

MR. STEIN: Yes. This is another problem which fits in with the kind of thing that Mr. Vaughn brought up. This isn't just here. In every city, many industries and people are disposing of wastes and doing what comes naturally and surreptitiously by using the storm sewers. Where you have tremendous loads coming out of untreated or inadequately treated wastes from industries and cities, this is not apparent. However, once you have in effect a cleanup program and see these wastes coming down, then you begin to trace them, and this very well may be one of the problems that we have to solve.

Let me ask one more question. Let's suppose all the plants were on line with satisfactory treatment. Is there enough residue around in the harbors where we are going to have the results of these pollutants for awhile until they clean out?

MR. BOWDEN: I think for a short period or while there will be some residue from the harbors. However, in certain instances where industrial processes have been eliminated completely the data has shown improvement. An example of this is the elimination of the zinc or roasting process and the concentration of zinc in the Indiana Harbor Canal has been decreased considerably since the elimination of that process. So I feel confident that our analysis will show improvement when all the work is completed.

MR. POSTON: Mr. Chairman, I think both Mr. Vaughn and Mr. Bowden have shown that we do have or we at least haven't eliminated pollution in the south end of the lake and that we have had a lot of growth in this area both in population, as evidenced by new municipal treatment plants being built, and I am sure there has been obsolescence of others. We have had difficulties with operation.

But I note that we are going to, and this is being done by the States on their own, they are making surveys, for example, in the Gary area, with consideration being given to tertiary treatment, and I note that some of the industries are going to advanced treatment of their particular wastes and this is above and beyond the requirements that have been set for them by this Conference.

I also note that we have in progress a Four-State conference on the total of Lake Michigan and in some respects their requirements are greater than they are of the people in this Calumet area. I think that the requirements of the Four-State conference should be and are being taken into consideration by the State of Illinois and the State of Indiana, but there is a question in my mind as to whether or not this committee ought to review the requirements that they have for industries and municipalities and review and see what the situation is, whether they need to strengthen these any or whether they do not need to.

MR. KLASSEN: Let me comment on that a minute. So far as the State of Illinois is concerned, I am sure that Indiana will make the same statement, you refer to the Four-State recommendations, I must remind you, Mr. Poston, that those recommendations of the four States apply to all of the States with the exception of those areas that are covered in this conference, and when we get into tertiary treatment and this type of thing, it is my interpretation that the Four-State conference recommendations do cover this area.

MR. POSTON: Yes.

MR. POOLE: That is right.

MR. KLASSEN: No further action is necessary on the part of either State to adopt those.

MR. STEIN: Are there any other comments?

If not, thank you, Mr. Bowden.

MR. POSTON: I think, Mr. Klassen, I recognized that those Four-State conference recommendations do apply to the total area, but I wondered whether they should be given further consideration by this particular action.

MR. STEIN: I wonder if we could hold that until the discussion at the end, because this seems to be, to me, the kind for executive discussion if we want to get into that question. Is that possible?

I believe Mr. Egan may have one more participant.

MR. EGAN: Yes, Mr. Bacon will expand on the report he gave yesterday.

PROGRESS REPORT ON INDUSTRIES IN THE METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO, VINTON W. BACON, GENERAL SUPERINTENDENT, MSD, CHICAGO, ILLINOIS (CONTINUED)

MR. BACON: Mr. Chairman, Conferees and ladies and gentlemen.

We have asked to reappear today to be sure that some of the points of yesterday's discussion were retroactive complete. In preparing for yesterday's session, the call for the meeting did not state specifically what was desired, and we desired to keep the statements rather general, grouping them as to whether they were in compliance or not, and I think we reported to you that the principal discharge into the lake and the only one from the Illinois side was U. S. Steel and that they would be in compliance by December 31, 1968. I might add now in the light of what was brought out yesterday afternoon, there will be no requests for any extension of time on that deadline because they will be meeting it as far as we can tell now.

V. W. Bacon

By way of elaboration, too, since it was brought out yesterday afternoon that the industries from Indiana were making individual reports while those from Illinois were not, again we have always assumed the position that since they are under our jurisdiction it was our responsibility to report on behalf of them. That procedure could, of course, be changed in the future if the Conferees desire it.

But back in September of 1968 U. S. Steel met with us with their attorneys, their engineers and others and submitted to us about a 25-point improvement program, which can be called a CPM,(critical path method) network, showing the dates of specifications, of bids, of placement of purchase orders, design fabrication, materials and construction. And we have been in continuous contact with U. S. Steel, the only discharger to the lake on our side, on this program and this is the one that means that they will meet the requirements of the Conference on December 31, 1968.

Now, there is another extremely important thing that might not have been clear yesterday in our discussions. In the March 9, 1965, findings of the original Conference there was a finding No. 13 and this finding simply said--I don't know if I can quickly find it--simply said that in order to prevent the flow of the Calumet River to Lake Michigan that every effort should be made to close O'Brien Lock by January 1, 1966. Now, I think this is worthy of just a couple of minutes of discussion.

You will see over on the far side of this map the Cal-Sag Channel, the Blue Island Lock. That was the lock that existed for many, many years prior to Blue Island. And as a result of that lock, the Little Calumet, when it was ever in flood flow, flowed into the lake, the Grand Calumet flowed into the lake through the Calumet River system, and this happened frequently.

But with the construction of the O'Brien Lock, and you will see it cuts off the Grand Calumet from the east and it cuts off the Little Calumet from the west, it was possible beginning on July 1, 1965, to prevent the reversal of the flow of this particular river and all of the industries on it back into the lake.

The frequency with which we violate this scheme would be very, very light. We would violate it if we have an intense storm, as we did I think it was Christmas Day of December of 1965, when at the request of the

City of Hammond, which was in flood, and the Grand Calumet couldn't get out, asked us to open that lock in order to protect the City of Hammond. We did that. That is the only time that we have opened O'Brien except in the very recent storm also, and I am not sure of the length of time, about a couple hours, of August 16 and 17 when we have had to reverse it to the lake.

So this is why we have said the industries on the Calumet River do not reach the lake and, therefore, they are not a problem except on those very rare instances. And one of the things I was so pleased to hear this morning, and we were seeing the reports for the first time, too, from the Federal Government, is that that sampling station at the mouth of the river shows not meeting river mouth criteria, but that little dot out in the Calumet Harbor meets the criteria for all purposes except, I believe you said, ammonia. Now, if we were reversing the river, such could not be the case at all.

Now, therefore, the industries that are on the Calumet River that I reported on in general yesterday, I want to go back to them again today.

I undersold them a little bit when I

said we had them under requirements of the September 30, 1969, in that these companies are actually in compliance with the State requirements for September 30, 1969, right now. Allied, Bulk, Chicago Brick, Com. Ed., General Mills, Gulf Oil Company, Spencer Chemical Company, Swift and Company, and United Chemical Corporation. So they are not only in compliance with the Federal Conference but also with the requirements of the State Sanitary Water Board, the Federal Government and our requirements also. We are continuing in that stretch having some trouble with Cargill and Catalin Corporations, those troubles coming about by breakdown in equipment. They will be in compliance well in advance of September 30, 1969. About a 90-day problem with Ford Motor Company, but as far as the other industries are concerned, as we reported yesterday, all except two we anticipate will meet the additional requirement of September 30, 1969.

Now, with those two, and I am going to return now to one, U. S. Steel, where they gave us two pages of CPM to get to the December 31st deadline, they have given us about ten pages of construction item by item to meet the next set of requirements. It is not a question before us yet or as we see it before this

Conference as to what might happen come September 30th whether they can actually meet that timetable, but we will then or in advance of then at that time be in touch with the State. But they all are either in compliance or actively getting there.

Now, in closing I would just like to say one word for the benefit of the Conferees and I think for the public too. In this very difficult process that we are all going through, and costly, we enjoyed the finest working relationships with Mr. Poston, the Regional Director, and Mr. Klassen, our State Sanitary Engineer. And I am going to illustrate this to show you what they are doing and we are doing in order to keep this working relationship of the closest type of communication.

Back in August, and to be precise on August 19, 1967, we made a four-part report to the State of Illinois Water Pollution and Water Resources Commission. One part pertained basically to industrial wastes, the subject of this Conference as we see it from our point of view. We had a 58-page report on industrial wastes at that time, where they originated, the strength, and so forth. And we had the pleasure of sitting at the

Conference table with Mr. Klassen and with Mr. Poston and they were furnished copies of all of these volumes, more than one copy, in fact.

Then in April of 1968, in keeping with the newly-found powers of the State Sanitary Water Board, Mr. Klassen wrote to our office a six-page letter asking detailed questions, and it was nothing but questions, on surveillance, stream water quality standards, sewage and industrial waste collection, treatment, and disposal, and as a result of that inquiry--it took us until April to get the answer to him--we filed this report with the State Sanitary Water Board as a part of the cooperative effort, at which time we also furnished a copy to the Federal Government.

Now, lastly, at about that time the Federal Government had been invited in, the FWPCA, to do a study on the Sanitary District to find out: are our sewage treatment plant facilities working properly, are we getting the most out of them and are we doing a good job on industrial wastes. This report raises lots of questions and makes lots of recommendations, but I think the key thing here that I must read to you gentlemen is from the introduction of this Federal report, and it is very brief:

"At the request of the President of the Board of Trustees of the Metropolitan District of Greater Chicago, personnel of the Technical Advisory and Investigation Branch of the Federal Water Pollution Control Administration evaluated sewage, stormwater and industrial waste collection, treatment and disposal in the District."

Second paragraph and the closing one:

"The resulting reports are based on data from the Metropolitan Sanitary District's operating records, observation and information provided by District personnel, who were extremely cooperative in providing information requested and full access to their facilities and records. The evaluation was possible because of this cooperation."

So, gentlemen of the Conference, at any time you feel you are not getting what you want, if your request is clear to us, we will give you our entire shop, hoping that you can help us with some of the records too from time to time. But whatever you want, if you will express it so that we know clearly, we will bring that kind of a report in to you with pleasure and your people are always welcome, as Mr. Poston, Mr. Klassen and others know, because we do have, I would say, almost daily contact.

Thank you very much.

MR. STEIN: Are there any comments or questions?

MR. POOLE: I have a request. I wonder if the Conferees could have copies of Mr. Bacon's remarks yesterday. He seemed to be talking from a prepared paper and I didn't get a copy. Maybe the rest of you did.

MR. BACON: We had only the general statement, Mr. Poole, because that was what we thought would be sufficient. We saw that list of industries upon which apparently individual comment was wanted at that time, so our industrial waste group, Mr. Lavin and Dr. Stein and others, had to make notes thereon. By the way, I would like to leave with you today two summaries that we did prepare yesterday after leaving here listing those that are right now in compliance with the September 30th and listing what they have done. I have just the one copy. I will file it with the recorder and I am sure we can get Xeroxes for you immediately.

MR. POOLE: Could I ask, then, Mr. Poston, that you reproduce that and mail us a copy?

MR. POSTON: Right, I will.

MR. BACON: Mr. Poston? I will file this with you right now.

(Which said report filed by Mr. Bacon is as follows:)

The following companies' effluent are meeting SWB-15 Standards at the present time. They have installed necessary equipment or their effluent is being discharged to M.S.D. sewers:

ALLIED CHEMICAL COMPANY - at present time in compliance and facilities have been installed.

BULK TERMINAL COMPANY - at present time in compliance and facilities have been installed.

CHICAGO BRICK COMPANY - compliance with and facilities have been installed at the present time.

COMMONWEALTH EDISON CO., CALUMET STATION - have installed the necessary facilities and are now in compliance.

GENERAL MILLS - is in compliance and facilities have been installed.

GULF OIL COMPANY	- is in compliance and facilities have been installed.
SPENCER CHEMICAL	- (Same company as Gulf Oil)
SWIFT & COMPANY	- is now in compliance with and has installed all of its equipment at the present time.
UNITED CHEMICAL CORP.	- is now in compliance with and has installed all of its equipment at the present time.
CARGILL	- been in compliance as to facilities but a recurring problem has occurred and presently we are in conciliation with them to alleviate the new problem.
CATALIN CORPORATION	- were in compliance and a new problem has occurred and they will have the new facilities in by 9-30-69.
FORD MOTOR COMPANY	- will be in compliance within 90 days at which time all facilities will be installed and in operation.

V. W. Bacon

INTERLAKE STEEL-BLAST FURNACE, COKE AND RIVERDALE PLANTS - they are in the process of installing their facilities. Compliance and the installation and operation shall be completed by 9-30-69.

WISCONSIN STEEL WORKS - have submitted plans and a bar graph and has ordered equipment which should be installed and in operation by 9-30-69 to comply with SWB-15 effluent standards.

REPUBLIC STEEL - has forwarded to us their plans and bar graph for compliance but their plans are at present under review.

U. S. STEEL CORP. SOUTH CHICAGO WORKS PHASE I - they are in compliance with the Federal Standards and have submitted plans and bar graph for compliance and at present it is being reviewed by the District.

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ALLIED CHEMICAL - Approved December 3, 1968

1. 3, 5, 6 Outfalls plugged
2. Lead coolers removed from service
3. Skimmers installed
4. pH Control

Meet SWB-15 Standards for Calumet River

BULK OIL CO. - Approved September 3, 1968

1. Eliminated all industrial waste discharge
2. Built separators and lagoon
3. Domestic Waste secondary treatment meeting SWB-15 Standards

Meet SWB-15 Standards

CARGILL CORPORATION

Violation now in administrative procedures

Problems oil, BOD, Suspended Solids, Ammonia Nitrogen and Bacteria.

Meeting scheduled for December 12, 1968

Were in compliance on November 17, 1965 but recent changes brought about violation.

CATALIN CORPORATION

Were in compliance.

Original violation solved by connection to MSD System. Recent violation by failure of lagoon. Will be in compliance of recent violation - June 30, 1969. June 30th date, a Board Order date.

CHICAGO BRICK COMPANY - Approved November 30, 1965

Eliminated all discharge to river - have closed lagoon system.

COMMONWEALTH EDISON CO - Calumet Station

Approved - July 16, 1968

No violation of July 16th data.

FORD MOTOR COMPANY

Company schedule to be completed in 90 days from December 31, 1968.

Violation unsightly discharge.

Will be in compliance with all parameters of SWB-15

Connecting to Metropolitan Sanitary District sewer.

GENERAL MILLS

Violation - BOD, Suspended Solids, pH.

Diverted boiler blowdown to sewer, installed grease removal facility

Approved January 30, 1967 and again March, 1968.

GULF OIL

Violation - Latex material, pH, Suspended Solids

Violation occurs when lagoon overflow reaches the river.

Latest violation October 8, 1968 resulted in conciliation compliance date Dec. 1, 1968

INTERLAKE STEEL (Riverdale & Chicago Plants)

Company eliminating nine outfalls and constructing pH neutralization plant at present.

Compliance with SWB-15 September 30, 1969 completion date on schedule

REPUBLIC STEEL

Company proposes construction of treatment facilities.

Completion scheduled for December 31, 1970

Design and engineering proceeding.

SWIFT AND COMPANY

November 7, 1967 were in compliance.

UNITED CHEMICAL

1. Installed sewer system

WISCONSIN STEEL

Violations Suspended Solids, Ammonia Nitrogen, Cyanide, Iron, temperature.

Company has elimated outfalls and is constructing treatment facilities.

Complete re-ciricculation of process water proposed

Compliance with SWB-15 Sept. 30, 1969

MR. POOLE: Now I want to make one other observation for the benefit of the Conferees. We apparently have some conflicting testimony here this morning with respect to the flows in the Calumet River. I am pretty sure I understood Mr. Vaughn to say that they had observed the Chicago Water Department outfall flows during their 1968 sampling. As I followed Mr. Bacon, he said that the only time there has been any reversal was in 1965 at the request of the City of Hammond and for two hours in 1968.

MR. BACON: There is a phenomenon here, and this is why I believe it is worthy of bringing out and discussing. You can't have a stagnant--say that the O'Brien Lock is closed and the sluice gates to the side are not open. That would mean that there would be no water flowing from the lake through the Calumet River into the rest of the system. The lake stands ordinarily a couple of feet above the canal system. During that time the Calumet River sits there as a lake, but you can have a strong wind, we will say upstream to downstream, which could cause a slight surface movement. But again it can't move the whole body of water. If you had a movement of--and you can set up a surface current, as we all know.

But with that exception, we know when that river is reversed and that river is either stagnant or it is flowing, and we can give you the actual flow records because we have to account to the Corps of Engineers for movement of lake water out of that system. It can't flow the other way unless the river system landward of O'Brien gets above the lake system.

We would be pleased, if you want such information, to give you the absolute log, because we have it, of operation--and by the way, I believe we do this in cooperation with the Corps of Engineers, their recordings of the number of lockages, because that is one way we compute the flow through the--and if you would like this information, Mr. Conferees, we would be delighted to furnish it to you.

MR. STEIN: Any other statements or comments? Mr. Poole.

MR. POOLE: Just one observation. As far as the inner harbor is concerned, and the mouth of the Calumet River is inside the inner harbor area, I can't see that it makes too much difference whether the flow from the Calumet River reaches that inner harbor area by a reversal or a closing of the O'Brien Locks or whether it reaches it as a result of wind currents, if we have industry discharging into it.

MR. BACON: The difference, of course, would be quantity, and that is a very great difference.

MR. POSTON: I think there are times when the O'Brien Lock is closed and you develop a wind from the west that will lower the lake level by as much as a foot, and at that time there would be a foot of head that would be forcing the water from the Calumet River out into the lake and you get these fluctuations in the level that do cause reversals of flow.

MR. BACON: Yes, they could be slight reversals, except that I would add that most of the year, except in the winter months when we are conserving diversion water, most of the year there is a steady flow. In other words, we keep a positive displacement. If the locks aren't in operation the sluice gates are and we are maintaining a flow away from the lake at all times The value of that flow, the records would show, will vary from about 150 cubic feet per second up to somewhere near 300 and 400. So we have the positive displacement at all times which would offset this at least wind effect when we are diverting.

MR. STEIN: Are there any other comments or questions?

If not, thank you, Mr. Bacon.

MR. BACON: Thank you very much for the opportunity.

MR. STEIN: You know, Mr. Klassen, this has nothing to do directly with what Mr. Bacon said, but you are talking about the engineering explanation, and I know that you and many of us have followed that Chicago diversion case since the early 1920's and since then the engineers have been talking about the hydrology of the system. And I have found that they always had a refined thinking on how the water goes one way or the other.

(Off the record.)

MR. STEIN: We will stand recessed for 15 minutes and come back for executive session.

By the way, all the participants, as I understand it, have completed their statements. The only ones who will be permitted to participate after we come back are the Conferees.

(RECESS)

EXECUTIVE SESSION

MR. STEIN: Let's reconvene.

We can look back with a considerable amount of satisfaction on the program that we have had since 1965 in the first Conference. We are probably in the middle of the biggest industrial cleanup that we have had in the country in the lower end of Lake Michigan. For the number of industries and the variety of industries, the magnitude of the problem, this is the first time it has been done. Many of the industries have had to install--and this is not very apparent in their presentation--brand-new processes and in effect they have been pacemakers in the field. The municipalities have gone along with this too.

I do think we have an example here of the best type of Federal-State-municipal-industrial cooperation that we can have in this country. Obviously if we are going to have that, there occasionally have to be a few abrasive edges. But whether these abrasions are here or not, I think we are moving on to the objective of clean water very, very well.

Let me point out what we have done here with all the parties concerned, and that means State, Federal, the District, municipalities and industries.

From the beginning, we worked together in committees for weeks on numerical criteria and managed to arrive at an agreement which was unprecedented in this field. We all got together with meaningful figures that the governmental units and the industries believed they could live with.

Then we came up with time schedules, and the States and the Sanitary District worked out with their industries the specifics of what had to be done. The specifics were laid out and made a matter of public record, the time schedules were assigned and the work has proceeded.

We have gone through industry by industry, plant by plant and municipality by municipality the record of compliance. This is the only way I know to do this. Without any reservation, I would say that this kind of record of compliance has been excellent. In light of the problems we face and the complexity of problems here, it has been magnificent. I know of no place where we have had a complicated situation like that in which everyone has come along as they have in this situation.

Again I think there is no disagreement, really, on the facts of what had to be done, and industries and the municipalities are recognizing in a very sophisticated manner that the kind of bare minimum requirements we had when we set them up in 1965, both for municipalities and industries, possibly might not be enough and they already have plans to go further. You have heard from the steel companies, the oil companies, and many of the municipalities that they are going ahead with phosphate removal and tertiary treatment and other plans of handling their wastes.

I think it is reasonable to say that we have had a bona fide effort of compliance by all the industries and all the municipalities concerned. This means 100 percent effort, practically 100 percent. Let me make one reservation or two for that. They are, of course, Adolph Plating in Indiana, which is not in compliance, and one or two of the smaller municpalities which may have some problems. But aside from that, I think from the other industries we have had this compliance.

In that one case where there has not been compliance, Indiana has made all the effort that can be required of it and it can do, at least under the water pollution control agency under its law, and has referred its case to the Attorney General. I am sure that Adolph Plating, if it doesn't comply, is in violation of both State and Federal procedures. We hope that this will be solved through State procedures. If it isn't, of course the Federal procedures will be available, but there is no doubt that this company must comply.

Aside from that, we have had, I would say, about 100 percent compliance, give or take a few municipalities which are plagued with the municipal problems that everyone has, and I think this is a remarkable record.

In addition to that, we find that the bulk of the cities and the bulk of the industries are going to meet the December 1968 date. A few will be completed among the smaller cities and industries, oh, in anywhere from three to six months where they are finishing up some of the work. But I would say that they are all in substantial compliance.

Now, we did have a situation where in Indiana three of the steel mills, United States Steel, Youngstown Sheet and Tube, and Inland, indicated from the first that they did not think they could make the schedule. I think all the people asked the industry to take a hard look and see how well they could come up with a program. At the progress meetings it was indicated that they more or less wanted an 18-month extension for their work for the deadline. Again they negotiated with Indiana, they have looked over their plans and specifications, and as you can see from the reports of the industry, they moved a considerable portion of their remedial program up before that 18-month date.

It is true in almost all cases, either 14 or 18 months is the terminal facility, but this doesn't go in any manner or means for all the plants.

To point out, for example, with U. S. Steel they are going to have possibly in a year about 90 percent removal of the oils and 90 percent of the solids, and this will move on as we go into this period.

So while the terminal date may be 14 or 18 months for these industries, I believe the record will indicate that they have made a bona fide effort to move up their remedial program as rapidly as possible.

Also in particular relation to these industries, when we look at the details of the plans and the amounts of money committed and the quality of the work, of the construction and the operation of the work already put in, I would think that the record clearly indicates that these companies are making a bona fide effort to comply with the requirements of the Conferees. In fact, not only are they making a bona fide effort, but in some cases and in many aspects of the plant they are making a pioneering effort and installing equipment that often has not been used before or used before in this country, and they are backing their convictions with what in any league would be large amounts of money. So I think the record is clear on that.

Now, I would propose that in view of this record the Conferees consider that the proposals made by the three steel companies, United States Steel, Inland and Youngstown, for their schedule be approved, with this proviso, that the State of Indiana get together with these companies, obtain from them in writing a stipulation affirming from the industries their intention to comply with that schedule, and copies of this be made available to the Conferees.

Is there any comment on that first proposal?

MR. KLASSEN: Only on this question. Is this information going to be furnished to the Conferees before we make a definite decision on the extension or is this a condition that we are assuming is going to happen if we make a decision?

MR. STEIN: Well, the way I put it, this would be the condition of doing this and we would assume that that would happen.

I would like to ask Mr. Poole if he expects any problem on this?

MR. POOLE: Well, Mr. Chairman, I obviously can't speak at the moment for the three steel companies, but I would not anticipate any problem, for these reasons:

Following our September 1967 meeting of the Conferees, at which time Indiana had proposed an outside date of June 30, 1970, for several of the steel mill facilities, the Indiana Board had a meeting on October 26, 1967, it was a special meeting, at which time the sole problem or subject on the agenda was the timetables for these steel mills. We had a court reporter at that meeting and the dates that we have submitted to you here today or yesterday in our report, and they are the same dates that were submitted by the representatives of the three companies in their presentation, were proposed to the Indiana Board by the three steel companies. We had a court reporter present and there is a complete record of that meeting.

Following that, the Indiana Board at its December 19, 1967, meeting spent a great portion of that meeting in discussing the proposals that had been made to us in October of 1967 and went on record formally as accepting those proposals. That was rediscussed by the Indiana Board at our November 1968 meeting, at which time the Indiana Board reaffirmed its acceptance of those dates.

The reason I am mentioning this is that we have had under review since December 1967 until the November 1968 meeting what the steel companies are doing, and in our judgment they are acting in good faith, they are going about as fast as you could expect anybody to go under all of the circumstances, and it was on this reasoning that the Board reaffirmed its acceptance.

So without consultation with the steel mills, I can't see how any of them can object to reaffirming in writing to us the same dates that they gave us in the October 1967 meeting.

MR. STEIN: Mr. Klassen?

MR. KLASSEN: I would like to make a suggestion, Mr. Chairman. I want to preface my suggestion by saying--and I mean this, it isn't just words--that I am not questioning the sincerity of the steel companies nor the report that Indiana has brought to us.

I want to make this suggestion, and this follows a policy that the Illinois Sanitary Water Board follows, and we are very often faced with this same problem, where we get a request, we get the information, but prior to making a decision we make a field check and get any further information that we think we need. And I for one Conferee feel that we should--again, not that we question what these steel companies are doing, but as a Conferee and as a staff job -- visit these installations, and I would suggest take the press along so that everybody knows what is going on, to see actually what is in operation and what kind of an operating job that they are doing, and get some of these commitments that Mr. Poole says they have. He has no question about them and I am not questioning that. But I would like to have before me something real definite from the steel companies as to what they propose and the dates. Because I can say, I plan to ask and find out when they started their program, what the reasons for any of the delays were. After getting all of this together then we will be faced with making a decision, and if we decide to extend the deadline, and we have got to either say yes or no, and if we say no what are the alternatives. And the policy that we generally follow in our own State is that you get a job done faster if you have someone that is diligently pursuing the job and needs a little more time than by going back into a court proceeding.

As I see it, the alternative in this case would be a formal hearing and all this type of thing that might take a lot of time. This is a consideration that we would give at that time to whether this is the course we would want to follow or grant these extensions.

Then secondly--and these are some of the things that I would want to personally evaluate as a Conferee--after I have gotten the information on the site and some further questioning of these three companies, then to determine whether we agree with the time that they want. Maybe we won't agree. In our own State very often we don't agree. And I can only take a page out of our past experience--this might be a personal opinion--by denying a time extension on specific requests in the past, I think we have squeezed down and maybe taken a year off a previous proposal by letting it be known that we will only consider extensions if there is a valid reason for it. To me it proved that a previous request for time had a lot of fat in it, because now we find that they met a shorter schedule.

And my definite suggestion then, Mr. Chairman, is that I am not ready today, based on these bits and pieces of information that we have, and I am not questioning those, to say yes or no right now. I am making this suggestion, that each Conferee do what he wants to to evaluate this request. I want to see this request down in writing someplace with a firm commitment from these companies more than just this presentation --following our own policy, a signed statement by top management. It is one thing to have the technical people tell us something, but we like to see the top management committed to this thing.

These are some of the things that I want to go into. It would just seem to me--I am speaking again for myself--that this is the next step that the Conferees would take and reconvene maybe in ten days. I think maybe my own staff could get what I want and myself get it in maybe a week to ten days and then reach this decision as to whether we are going to grant an extension, if so how much, and if not what our next step is going to be.

MR. STEIN: Are there any comments?

MR. EGAN: Mr. Chairman.

MR. STEIN: Yes, Mr. Egan.

MR. EGAN: I don't have any doubt about the presentation, but before I would vote for an extension it would have to come in a more formal manner. After listening to Mr. Vaughn representing the city and Mr. Bowden, it indicates that in spite of the improvements that have been made there has been no improvement in the quality of the water. If anything it is slipping a little bit. So I would want a more formal presentation before I would entertain any thought as far as a continuance.

MR. STEIN: Mr. Poston, do you have anything?

MR. POSTON: I was just going to ask what the other Conferees thought and they have pretty well given me the answer.

I appreciated the Chairman's itemization of several items--that we had had great accomplishments and we had had a lot of cooperation, there had been some abrasive edges and we have come up with time schedules, and industry by industry we have listened to these, we have heard municipality by municipality and essentially everybody is coming along in good shape.

But I think really that the reports indicate that we have got 1965 water in 1968, and I am sure, and I am sincere, I think they have made bona fide efforts to come up with improvements in this water, there is no doubt in my mind but what they have. I think that when we got into this, that is the Federal Government got into this, it was only because it was a last resort. I see now, as indicated by John Egan and by Jimmy Vaughn and our survey report, that our water is still 1965 water.

I think that more important than a time schedule is what are we going to do, how are we going to make that water better.

MR. STEIN: Let's hold that for the next point. I raised one proposal for discussion. Let's hold to the time schedule now, because the other is going to be a big topic of discussion.

MR. POSTON: I have one other point here that I got conflicts on. At least the message that I got was two different messages relative to the Calumet River as to when this work was going to be completed. It appears to me that some people think that we turned this river around and, therefore, we don't have any more jurisdiction with this, and I would like to know what some of the other Conferees feel about this. This has never been my idea that just reversing this flow then we throw it out the window and don't have any more concern for this. It isn't real clear to me what should be done, and I think I could go along very well with Mr. Klassen--that some review of situations would be not only enlightening but would enable a more sound decision to be made.

MR. KLASSEN: I don't want to ask Mr. Poole this, because I know he can't answer it. I wouldn't want to have any of the representatives from industry here, but I would like to include in this document that we hope we will get from top management that, barring any acts of God, this time schedule that they are requesting, if they didn't meet this time schedule they would cease operation of the plant.

MR. STEIN: Are there any comments?

MR. POOLE: I want to ask Mr. Egan a question in clarification.

What do you mean, Mr. Egan, by you would want a more formal document? Would you accept, pursuing Mr. Stein's proposal, that we seek from the steel companies a reaffirmation of their request for extensions, and going a step further and following Mr. Klassen's suggestion, that that be made by top management of the steel companies and then submit that to the Conferees? Is that adequate for your purpose as a formal document?

MR. EGAN: I would expect something of that manner. And then evaluate the document when we get it, timewise and what has been accomplished so far, and I think those things should be taken into consideration, their effort up to now and what they have planned for the future and whether they can accomplish it in the time they are asking or why can't they do it sooner.

MR. POOLE: That is about what we did in 1967.

MR. STEIN: Yes. Well, here, I think, Mr. Poole, let's go with it that this is the consensus of the Conferees. I thought and you know this is a question of Federal-State relations; this is the job that the State of Indiana had. Mr. Klassen's point is well taken--the question of squeezing the fat out. The notion, I thought, was the job that is traditionally done with the State and its constituents and, hopefully, Indiana did that in the negotiations it had up to now. Now, if the Conferees would want this in writing--and I can appreciate the request for the stipulation in writing--to come forward, that is one point. They may want an inspection. I believe those are the prerequisites of Mr. Klassen's proposal.

I recognize the fact that Mr. Poston has raised two other points that we will come to in a moment. But let's try to handle this first one. On this extension, shall we ask Mr. Poole to obtain from appropriate top management of the three steel mills in question a stipulation reaffirming their presentation before the Indiana authorities and their presentation before us outlining these dates?

Secondly, can we arrange with them in the next few weeks to have an inspection? I don't know if you will--

MR. EGAN: Well, Mr. Chairman, Mr. Klassen suggested about 15 days, so that would bring us to about the 25th. That would be a good day to go around and make an inspection.

(Laughter.)

MR. STEIN: That is right. Well, that is what I was thinking concerning these 15 days. We are faced with two problems. The Conferees should recognize that we raised this problem many, many times before, but we kept putting this off until the last date to see if you were going to make it. Then if we put it off, the problem in giving a few days is we run almost beyond that expiration date. Now, another week is going to put us into the holiday season. That is why I wanted to leave this open. I am not sure that we will be doing any too great violence if we come back possibly after the 1st of January; the Conferees may want to do this. If we take 15 days or two weeks, we are going to be right in the holidays. Your point is very well taken.

There are, however, two elements here. One element is that we get this in writing--the stipulation reaffirming the statements from the industry. The other is that we make arrangements for an inspection of the mill. At that point Mr. Poole can make arrangements with the mill for representatives of the Conferees to be there, and any other arrangements for any other interested people that anyone might think is appropriate to see what is being done. After this is done we will be ready to reconvene.

Now, I would suggest that at least the documents be in our hands by the 1st of January. The reason I say that is that I recognize the problems of industry. This is an organizational problem. When one talks in terms of top management I might agree with you, it takes time for an industry to do this, say, by January 1st. If it is appropriate to arrange inspection trips before the first week in January and during the interim, fine. If not, these inspection trips will be made, providing we get these documents, not later than the first or second week in January and then we will have the reconvened Conference at the end of the inspection period.

MR. EGAN: On these documents, Mr. Chairman, these are going to be new and specific documents? They are not going to be a copy of the stenographic report that was made--

MR. STEIN: No, sir.

MR. EGAN: --to the Indiana State Board?

MR. STEIN: No, sir. Is that your understanding, Mr. Poole?

MR. POOLE: That is the way I thought you put it.

MR. STEIN: Yes.

MR. POOLE: That we ask the steel mills--

MR. EGAN: No misunderstanding.

MR. STEIN: There will be one of these documents. Now, again, and gentlemen I ask you to do this because we are in a very peculiar position there and I want to speak to both the Conferees on this side of the table, and I speak real honestly here, what we are doing--and maybe we are in this position more than you are--we are dealing with the problem of Federal-State relations, Federal-State-local relations. Generally speaking, we make the assumption -- I do this not only as an assumption but on the basis of experience--that Illinois knows what it is doing and Indiana knows what it is doing and the District. We operate on the basis of full faith and credit. In other words, if Mr. Poole is going to get a document up, it has to be more or less what meets our objectives. It might not be exactly the kind of document we would have in a Federal procedure or you would have in Illinois or you would have in the District, but it is the kind of document which to achieve this purpose will do the job in Indiana. He will give it to us. As to the procedures to develop this, we are just going to have to leave that to the discretion of the jurisdiction concerned.

MR. KLASSEN: This is true, with this understanding, that if the information is not as complete as a Conferee would like, he could ask Mr. Poole to secure this. But I agree with you that in all probability the information we get from Mr. Poole will be what we want.

MR. STEIN: Yes. Of course, there can be prior consultation, informal consultation, to initiate this.

Well, if we could go ahead with this--that these documents will be available to the Conferees by the 1st of the year; we will arrange an inspection before then, if possible, but not later than the first two weeks in January; and we will try to reconvene the Conference, unless there are compelling reasons to the contrary, before the middle of January.

MR. KLASSEN: Conceivably the new Secretary of the Interior will make this decision, but I don't want to inject this into the picture.

MR. STEIN: He might. Well, I didn't want to put any further complications.

MR. KLASSEN: No.

MR. STEIN: There is another point that I want to make clear. That is while we are talking here, I don't want there to be any implication that Secretary Udall is ducking the issue either, because this was not our suggestion. This came from the States for this extra time before the decision was to be made.

MR. KLASSEN: This is true, but for the record this is your conference and you are calling the meeting.

MR. STEIN: Yes, we are. But what I am saying is I am suggesting these dates because I am sure that Secretary Udall is prepared to meet this issue head-on and I don't want there to be any implication that he is putting this off or might be for the new Secretary.

MR. KLASSEN: There has been no implication at all. But don't put the late date on the back of the States. You could have called this anytime you wanted to, so don't blame us for this delay. I am merely injecting this question in here before we make a decision, this is the time that I want.

MR. STEIN: I am not injecting anything. I wish we could come to the agreement, but I think the record of all these Conferences speaks for itself. I raised this issue a year ago and six months ago and hoped to resolve it then. It was at the urging of some of the State Conferees that we put off this question until now, and that may have resulted in our problem.

MR. POOLE: Mr. Chairman.

MR. STEIN: Yes.

MR. POOLE: I have two questions. One is on this inspection, who is going to make it? I might add that we didn't introduce it, but we have had two of our employees in the room for the last two days that have made inspections within the last three or four weeks of the steel companies and the other large installations in Indiana also, so I think that what we said to you yesterday is substantially correct. Are you talking about the people at this table making the inspections or are you talking about us designating some of our technical and professional people to make the inspections?

MR. STEIN: Either way. Again, and on this I agree with Mr. Klassen, without casting any doubt on this, this is something like an auditor. When you say that, the man wants a look for himself. Now, I think what has to be arranged and should be arranged properly is that Indiana has the primary right and responsibility to go into these plants and do this, that you should make an arrangement with your plants, get together with the other three Conferees and have them designate whomever they wish to go with you on the inspection, come up with a date certain and an hour certain for each plant, decide in advance with particularity of what you want to look at and let the people go and look.

MR. POOLE: Couldn't that coordination better be handled by Mr. Poston's office than mine?

MR. STEIN: We would be--and again this is a question of States' rights and I can't speak for your industry. (Laughter) The question here is that on the police power of the State there is no question on your right of the entry into the mill. I don't want to invoke the precedent, except on a cooperative basis, although we do have that in the Federal law on these

Federal reports that are put into the law and ask for a Conferees' vote on that. I prefer to keep this on a cooperative basis.

But let me put it this way. If the mills and you have no objection, we will be glad to coordinate this.

MR. POOLE: I will work that out with the mills.

MR. STEIN: Right.

MR. POOLE: I don't see how they can have any objection to letting people come and see if what they said is so isn't so.

But my second question now is a little more important, and that is what are we going to do about the Illinois installations? M. S. D. has consistently contended that they are out of the act, but the State of Indiana has never agreed to that contention, and if we are going to consider timetables for Indiana industries and if we are going to inspect Indiana industries, I think we have got some up and down the Calumet River that need to be considered also.

MR. STEIN: Wait a minute, Mr. Poole. Again I just want to indicate as I see the record here, when you talk about M.S.D. or when they talk about Illinois or Indiana, generally you ask who spoke, is it a man or the Governor or who spoke for the State? Now, as far as I know, the Secretary has indicated that the Calumet River and the industries there are included in the Conference, in the first Conference that was called, and this was included in the call of the second Conference. As I understand it, one of the Conferees--and I think you raised a very interesting point--wrote a letter, I believe, to the Water Pollution Control Administrator raising this question. As far as I know, we have a Conferee from the M.S.D., he has never raised this question.

Now, I don't see anywhere in the record that I would say that before this Conference from M.S.D. or the Conferee representing M.S.D. has the question been raised that these people are excluded from the Conference. If this is the next issue we want to take up, let's take it up.

MR. KLASSEN: I call your attention, Mr. Chairman, to my letter of November 13th addressed to John Egan, the President of the Board of Trustees, a copy of which you received, and this question was raised by the Sanitary District's legal department and I confirmed in this letter to Mr. Egan my comments, and it was not addressed to the Federal Water Pollution Commissioner, it was made at the request of the legal department, Mr. Rothenberg particularly, of the Sanitary District. I think this ought to be understood. This is the reason for the letter.

MR. STEIN: Well, is there a question before this Conference of the jurisdiction or not? Certainly no one has raised this question at the Conference with me or on the record. Is this a question? In other words, in the absence of anyone's raising the question and in the clear language of the calling of the Conference and the summary, I don't see that they are not included. Now, if anyone wants to raise a question on that, this is fine.

MR. KLASSEN: The question to be raised-- and this is strictly my opinion as stated in this letter-- we have a Conferee from the Chicago Sanitary District and the record shows that they have the prime responsibility for these industries. If they want to raise the question, that is up to them. But this is not, as the State of Illinois Conferee, for me to bring this question definitely before this Conference. I gave my opinion at the request of a Conferee and all of you got copies of it. I can only say that if the Calumet River is under the jurisdiction of this Conference, some place we have a responsibility to tell those industries what the water quality standards are that they must meet, and I would like to have somebody show me the water quality standards that these industries must meet that this Conference adopted.

MR. STEIN: Did we adopt standards for Indiana Harbor?

MR. KLASSEN: We are not talking about Indiana Harbor.

MR. STEIN: No, but we have had a program for many of the industries without adopting water quality standards for all these waters. The Conferees have not done this and we have moved forward. Now, I don't know, it may be a prerequisite to doing that. But on the Indiana side we have accepted reports and presumably are pretty close to making evaluations on a program of what the Indiana industries are doing without the adoption of these standards. How come that this requirement has to be in force in Illinois?

MR. KLASSEN: Only because the Secretary of the Interior approved these standards that we submitted to him for the Calumet River. Maybe he did in Indiana too, but this might be beside the point. They are the only standards on the Calumet River that I know of. Now, if the Conferees--this Conference has adopted other standards, then we will be guided by those. But I feel that there must be some standards that industry must comply with, whether it is our Conference standards or the standards that the State of Illinois adopted. The only reason we adopted these is because there were no others.

MR. POOLE: Well, Mr. Chairman, we did exactly the same thing in Indiana, that is we adopted standards for the Grand Calumet River and the Indiana Harbor Ship Canal, and in those standards we attempted--and I had assumed that Illinois did the same thing--to develop a set of standards for those waters which would assure us that we would meet the standards for the lake that had been adopted by the Conferees, and our standards have been approved by the Secretary also, everybody knows that.

My question, and the reason I raised it, is that if these areas are still within the jurisdiction of the Conferees, and based on the testimony that I have heard this morning of the differences in water quality at those two dots up there, one at the mouth of the Calumet River and one just over the State line inside of Indiana, and based on Mr. Vaughn's testimony, certainly I don't see how anyone can contend that the South Works of U. S. Steel isn't involved in this Conference. I am not willing at this stage of the game to concede that it is the only Illinois industry that is involved in the Conference.

And going back to what I heard from Mr. Bacon yesterday afternoon, the South Works timetable with M.S.D. goes over to sometime in the year of 1971. So this in my judgment deserves the same kind of consideration by the Conferees that the three Indiana installations deserve.

MR. STEIN: Do you mean just South Works or all those other works?

MR. POOLE: No, I think we need to take a look at the others to find out whether or not--it is pretty generally conceded that there are flow reversals of the Calumet River. Mr. Bacon has consistently been very vague about that. Conferee Egan just referred here on the Indiana situation that he wanted something that was more formal than anything that had been submitted to him yet, and I would remind him that if he were to review the records, there have been a damned sight more formal documents submitted to these Conferees by the State of Indiana than there have by the Sanitary District of Chicago. I can't even yet get a copy of the paper that Mr. Bacon read from yesterday in his testimony.

MR. EGAN: That is why we had him back this morning.

MR. POOLE: It didn't help much.

(Laughter.)

MR. EGAN: I certainly have no objection. I didn't mean that we would demand that just from Indiana.

And to answer, that letter for an opinion from you didn't come from me.

MR. KLASSEN: It came from your legal department.

MR. EGAN: It came from the Assistant Attorney. I knew nothing about it.

MR. STEIN: Right. Let's answer the first question, the easy one.

I take it that there is no objection from any of the Conferees that we get similar documents and have similar inspections on both sides for the Indiana as well as the Illinois industries and the industries under the jurisdiction of your District on the Calumet, is that correct?

MR. EGAN: No objection from me.

MR. STEIN: All right.

Now, if there is no objection, I think if you can make this arrangement, particularly in view of that, I think Mr. Poole's prior suggestion that Mr. Poston be the coordinator should be the one. Would you make the arrangements with the District and with the other people for these inspections?

MR. POSTON: Would you rather do that, Mr. Klassen, in Illinois?

MR. KLASSEN: If it is in the Chicago Sanitary District, this is under their jurisdiction and we have a Conferee that could speak for them.

MR. POOLE: Really isn't all we are talking about that each one of us, I presume, is going to be at liberty to designate one or more people to represent us on these inspections and that it is up to Mr. Poston's office to do some telephoning or corresponding, and so on, and set some dates?

MR. STEIN: Right.

MR. POOLE: Now, I think, knowing our mills as I do or the others, that there is no use to go at this unless you budget at least a day for each of these major installations. You are not going to see anything by going in there on one of these quickies on a bus, as we have done a time or two in some of the Indiana installations already. There are four facilities in Indiana. U. S. Steel has two, Inland has one, and Youngstown Sheet and Tube one. I don't think you can get through any one of those four, counting transportation time,in less than a day.

MR. STEIN: I think this is the point. I don't think this is an issue, fellows, if we are all in agreement, that we have to have an Alphonse and Gaston act. What we are asking for Mr. Poston to do is to be a coordinator and set this up.

I don't know who else is going to be invited to these inspection tours, and this will be up to you and up to the mill and up to the mill policy, but like anything else, I presume at least a schedule of when it is going to take place is public knowledge and available to anyone.

O. K. Now, since we are settled on that, let's try to keep with the same time schedule.

In answer to your other questions, the question not having been raised with the Chairman of the Conference, the jurisdiction remains as the Conference was called in terms of where the Conference was recalled, and I read that when I opened this Conference yesterday morning. That includes the Calumet River and the industries on the Calumet in Illinois, and I hear no one raising a question on this jurisdiction before the Conference. As far as I can see, the question is not on the record.

MR. POSTON: In other words, you are saying that the Calumet River is in the Conference area?

MR. STEIN: Yes, it is. I think there is no doubt. The language of the Secretary's calling of the Conference, the language of your notice, the language of the Summary is abundantly clear on that. Now, the only way you can raise the question, it seems to me, and I am not asking you to raise this, is to say that we take this out. But I think the plain words say that it is included. All right?

Now we will get to the next point, and I hope the next point, while the most important, can be disposed of very rapidly. I do think that Mr. Vaughn and Mr. Bowden, and several of the other Conferees, indicated what our big **problem** is going to be, and I know the issue of the time schedule and other things is a very important one. But the question is where do we go from here?

I have talked with Mr. Poston about this and I have a proposal to make. I think this is such an important issue on precisely how, if any, the water is going to be improved, and what, if any, points--and I suspect that they may be pretty subtle points, and specific ones--are we going to have to get at to effectuate further water improvement. I would imagine that this would be a major job in this area from here on out.

Now, we would propose that a committee--I hope this is going to be a top level one, as the Conferees should be directing this, with possibly some other groups -- check on compliance and to provide a continuing staff in a cooperative arrangement. I would suggest that Mr. Poston get started in setting up this group, that we utilize as much of the techniques and the facilities as we can of the State, the Sanitary

District, the industries concerned, but recognizing the limitations you have and the importance of the problem.

(Off the record.)

MR. STEIN: I would suggest that the Federal Government will give this a top priority and these people will be doing the technical job. Now, we are not making an effort to spend any more money than we have to, and any time a State or a city can provide the job, we should do this. We will have to work very closely with the Chicago water people, integrate these reports, and have reports made to the Conferees on a six-months' basis. These reports will have to indicate whether the waters are getting any better, what the prognosis is, and in particular to try to find out if the waters are not getting any better what the cause is, and if these can be ascertained to come up with specific recommendations on correcting them. If you have to have studies to find out what the causes are, then you should make recommendations on this.

This continuing program of where we go should be set up. All the **conferees** should designate their permanent representatives on this group, which will be the Board of Directors, and we should have that established. We can establish this by the first of the year and these people should set up their program and try to get the resources committed from the various agencies to the job.

Are there any comments on that?

MR. POOLE: Yes, you are talking faster than I can write, Mr. Chairman. See if you can summarize that now as an engineer would.

MR. STEIN: An engineer? We would have a technical committee looking at the improvements in water quality and determine if the present program is in an orderly manner improving water quality. If we are not producing the desired results, what has to be done with specific reference to points of discharge, volumes and strength of waste from those points, to control them.

MR. KLASSEN: Much better than the first time, Mr. Chairman. It is much better than the first time.

MR. STEIN: It is a question of taste.

MR. POOLE: I believe if we could try it

once more we could have it down to what we can understand. I thought you said at six months' intervals.

MR. STEIN: No, we are going to report at six months' intervals.

MR. KLASSEN: Do you want to try it again, Mr. Chairman, as a lawyer?

MR. STEIN: No, no, I am ahead now.

(Laughter.)

As long as you said it is much better, I am not going to look for the millenium. You will never say it is the best. (Laughter.) I am as far as I can go.

Is that agreeable? And I would suggest you appoint your members to this committee, again to be coordinated by Mr. Poston, at least the organizational meeting. You should be set up and when we meet in early January you should have had your meetings and come up with your proposal for your program.

Any other comments? I think that possibly about does it.

Are there any other questions or comments?

MR. POOLE: Well, only comment. You keep talking about making these inspections and getting back in early January, and I would remind you that this is going to take some doing. We are moving into the holiday season. Now, I am not stalling for more time, but--

MR. STEIN: Do you think the time is unrealistic?

MR. POOLE: My own staff is pretty heavily budgeted already for the rest of the calendar 1968, and I would hope you would give us a little latitude there in that it is going to take some doing to complete all these inspections, I would say, by the end of the first week in January.

MR. STEIN: Well, do you think the time is unrealistic? Do you need more time?

MR. POOLE: I think that probably a time for us to come back here, a realistic time, is sometime between the 15th and 30th of January, but not before the 15th, certainly.

MR. STEIN: If that is agreeable to the Conferees, that is all right.

Is that agreeable?

MR. KLASSEN: Yes.

MR. EGAN: Yes.

MR. STEIN: All right.

Executive Session

(Off the record discussion among the Conferees.)

MR. STEIN: If that is agreeable, we will move that date, we will have the inspections completed and be expecting to reconvene sometime between the 15th and the 30th of January. At that time we should have these documents in hand, the Conferees should have made their evaluations of the inspections, and we should have the report from the technical committee on what they propose to do in getting on with this program.

Are there any other comments or questions?

MR. EGAN: Do we adjourn?

MR. STEIN: I want to thank you all for coming. We used to have a phrase during the 1930's when I entered the government, one of the words that was in style then, that they called penultimate, and I hope this is the penultimate meeting and I hope after these inspections we can wind this up at the next one.

We stand adjourned.

(Whereupon, at 12:30 p.m., the Conference was adjourned.)

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